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Bibliography on High Level Winds (500-100 mb)

ol. 4 May, 1953 No. 5

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 4 MAY 1953 No. 5

SPECIAL FEATURE IN THIS ISSUE

A Selective Annotated Bibliography on High Level Winds (500–100 mb)

(*For complete table of contents see back cover*)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to ring to the attention of meteorologists current literature in their field and in related fields and provide bibliographic information on various subjects, as interest demands.

Part I contains from 175 to 300 abstracts of current periodical literature and monographs in ie fields of meteorology, hydrology, oceanography, etc. These abstracts are arranged ccording to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of from 50 to 250 im-ortant references on a special subject without respect to recency of material. No attempt made to prepare exhaustive bibliographies; instead, the aim is to include a representative oss section of the various aspects of a subject. Preference is given to recent material, omprehensive works, material from obscure sources, and items with good bibliographies.

Bibliographies previously published were:

o. Mo.	Vol. I, 1950	Vol. II, 1951	Vol. III, 1952
1. Jan.	**Atmospheric Pollution**	**Extended Forecasting**	**Climate—Northwest Africa**
2. Feb.	**Aerobiology**	**Long Range Forecasting**	**Carbon Dioxide**
3. March	**Cloud Physics**	**Soil Temperature**	**Climate—Paraguay, Uruguay, Argentina**
4. April	**Hail**	**Constants, Tables, Diagrams**	**Dew**
5. May	**Tornadoes**	**Climate—Near East**	**Objective Forecasting**
6. June	**Volcanic Dust**	**Climate—Middle East**	**Stratus Forecasting**
7. July	**Climatic Changes**	**Special Winds**	**Urban Climatology**
8. Aug.	**Thunderstorms**	**Radar Storm Detection**	**Climate—Central Africa**
9. Sept.	**Icing**	**Condensation Trails**	**Visibility**
0. Oct.	**Acoustical Propagation**	**Climate—Northeast Africa**	**Glaze and Rime**
1. Nov.	**Evaporation**	**Mountain Meteorology**	**Free Air Turbulence**

Bibliographies published this year are:

1. **Turbulence Theory,** Vol. IV, No. 1, Jan. 1953
2. **Turbulent Diffusion and Exchange,** Vol. IV, No. 2, Feb. 1953
3. **Frost and Frost Forecasting,** Vol. IV, No. 3, March 1953
4. **Climate of Australia and New Zealand,** Vol. IV, No. 4, April 1953
5. **High Level Winds (500–100 mb),** Vol. IV, No. 5, May 1953

Forthcoming bibliographies will be:

6. **High Level Winds (above 100 mb),** Vol. IV, No. 6, June 1953
7. **Jet Stream,** Vol. IV, No. 7, July 1953
8. **Radiation Bioclimatology,** Vol. IV, No. 8, Aug. 1953

Other bibliographies in preparation are:

Actinometers
Arctic Meteorology
Auroral Physics
Climate of Southeast Asia and the East Indies
Climate of the Pacific Ocean Area
Machine Methods in Meteorology
Microwave Propagation
Oceanographic Meteorology
Ozone
Snow Cover
Tropical Cyclones
Tropopause Variations

Part III contains a listing of the contents of those journals which are primarily meteoro-gical. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the December issue mulative author, subject, geographical and journal indexes are published.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DSG:	U. S. Army Medical Library, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorological Society) Library, Milton, Mass.
NN:	New York Public Library, New York, N. Y.
NNA:	American Geographical Society Library, New York, N. Y.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts

Geographic locations are in the English form rather than the form used locally, for example Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5–6):146–151, May–June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol 2), *Heft* 5–6 (No. 5 and 6), *pages* 146–151, May–June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

COMPENDIUM ARTICLES AND WORKS OF SPECIAL INTEREST

4.5–1 551.588:551.583

*†Pogosian, K. P. (*ed.*), Budyko, M. I., Drozdov, O. A., L'vovich, M. I., Sapozhnikova, S. A. and IUdin, M. I., **Izmenenie klimata v sviazi s planom preobrazovaniia prirody zasushlivykh raĭonov SSSR.** [Changing the climate in connection with the plan for transforming nature in the arid regions of the U.S.S.R.] Leningrad, Gidromet. Izdat., **1952.** 206 p. 50 figs., 34 tables, 143 refs. **DLC**—This excellent recent work contains seven chapters by various authors. Chap. I is entitled "Climatic regions and amelioration"; II. "Water balance in the atmosphere"; III. "Changing the turbulent exchange" (action of forests and shelter belts) by changing the turbulence or the vertical motion; IV. "Changing the precipitation regime" (by changing the moisture content, etc.) V. "Changing the heat balance and thermal regime"; VI. "Changing the evaporation, evaporativity and the soil moisture region"; VII. "Further examples of increasing the effectiveness of shelter belts" (reducing harmful winds, etc.) All the references, except 2, are to Soviet literature. The work contains a great deal of useful quantitative data in the form of scatter diagrams, schematic charts and tables. *Subject Headings:* **1. Climatic control 2. Climatic variations 3. Climatic amelioration 4. Shelter belts 5. Forest influences 6. U.S.S.R.**—*M.R.*

4.5–2 551.510.41

Cauer, H. (*Inst. of Chem. Climatology, Hohenberg, a.d. Eger, Germany*), **Some problems of atmospheric chemistry.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1126–1136. 2 figs., 4 tables, 60 refs.) **MH-BH**—The chemical methods for analyzing the atmosphere, namely: 1) the absorption tube method for determining the presence of secondary gaseous substances such as iodine, total chlorine, sulfuric acid, ozone etc. and 2) the condensation method for analyzing the water soluble constituents of the air which form condensation nuclei, such as halides, sulfates, soluble alkali compounds and organic compounds are described briefly. The concentration of iodine in the atmosphere and its origin; results of measurement of surface ozone concentration, the evidence that surface ozone is produced largely in nonhomogeneous electrostatic fields between clouds and possible other sources of surface ozone; the total oxidation of the air; the surface concentration of nuclei forming substances; evidence that sea salts disintegrate and that condensation media are produced by HCl and ClO_2; the formation of atmospheric nitrogen compounds and of atmospheric formaldehyde, and the pH value of the aerosol are reviewed. The relationship of short range molecular forces, namely: polar forces, dipole forces, induction forces and dispersion forces to condensation and the importance of the order of hydration in explaining the electrical double layer of droplets suspended in the atmosphere are discussed. *Subject Headings:* **1. Atmospheric composition 2. Chemical analysis of air 3. Compendium articles.**—*I.L.D.*

4.5–3 551.583:523.74

Craig, Richard A. and Willett, Hurd Curtis, **Solar energy variations as a possible cause of anomalous weather changes.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 379–390. 28 refs.) **MH-BH**—Description of the variable solar activity and of climate and weather fluctuations and a summary of research work in this field. The solar hypothesis as the primary factor controlling the entire spectrum of anomalous climate and weather changes from geological to daily fluctuations is discussed. The authors claim that the subject deserves careful study, as long as there remains a reasonable possibility of solar influences on irregular weather changes. *Subject Headings:* **1. Solar energy variations 2. Climatic variations 3. Compendium articles.**—*A.A.*

4.5–4 551.515.4:551.515.

†Faust, Heinrich, **Kaltfronten und Gewitter. A. Über Kaltfronten und ihre Einteilung B. Über Entstehung und Energiequelle der Gewitterböen. C. Statistische Untersuchunge an Gewittern im frontfreien Raum.** [Cold fronts and thunderstorms. A. Cold fronts an their classification. B. The origin and sources of energy of thundersqualls. C. Statistica investigations on air mass thunderstorms.] *Germany. Deutscher Wetterdienst in der US-Zon Berichte*, No. 24, **1951.** 55 p. diagrs., graphs, tables, refs., eqs. Price: DM 4,30. **DWB–** A detailed and systematic study of the many aspects of cold fronts and accompanying phe nomena, especially convective activity and thunderstorms. The work is divided into 3 parts The first part takes up the forms or types of cold fronts and their characteristics; the second the origin and sources of energy of thundersqualls; and the third, the statistical and forecastin aspects of air mass thunderstorms. *Subject Headings:* **1. Frontal thunderstorms 2. Thunder storm structure 3. Thundersqualls 4. Air mass thunderstorms.**—*M.R.*

4.5–5 551.583.

Flint, Richard F., **Climatic implications of glacier research.** (In: **Compendium o meteorology.** Boston, American Meteorological Society, **1951.** p. 1019–1023. 23 refs. **MH-BH**—This brief article deals with the history of research on the relationship betwee climate and the formation and disappearance of glaciers, changes in glaciers within histori times, variations in glaciers between the Wisconsin Maximum and the beginning of the Chris tian Era, the principal variations within the Pleistocene Epoch, the nonperiodic character o climatic changes and research needs in the field of glaciology. *Subject Headings:* **1. Climati changes 2. Glacial periods 3. Glacial ablation 4. Compendium articles.**—*I.L.D.*

4.5–6 551.510.41:546.26

Glückauf, E. (*Harwell, England*), **The composition of atmospheric air.** (In: **Compendiun of meteorology.** Boston, American Meteorological Society, **1951.** p. 3–10. tables, graphs refs.) **MH-BH**—The article gives details of quantitative measurements or surveys of chemica content of air, not only in respect to the principle components which vary (O_2, CO_2, A and He and the constant gases (N_2, Ne, Kr, Xe, N_2O, CH_4 and H_2), but also the rare species such a O_3, SO_2, NO_2, CH_2O, I_2, NaCl, NH_3 and CO; the composition of the upper atmosphere (th ozonosphere and stratosphere) and the isotopes of gases (water vapor, oxygen, hydrogen helium and carbon). The need for further research on the O_2, CO_2, H_2 and O_3 content of ai is stressed. The problem of a turbulent stratosphere, as opposed to one in radiative equi librium, is also presented as one for future resolution. (*Same as item* 3B–226, Feb. 1952 *MAB.*) *Subject Headings:* **1. Atmospheric composition 2. Carbon dioxide 3. Compendiun articles.**—*M.R.*

4.5–7 551.576.12

Howell, Wallace E. (*Blue Hill Met. Obs., Harvard Univ.*), **The classification of cloud forms.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, 1951 p. 1161–1166. 18 refs.) **MH-BH**—The development of the classification of cloud forms from the point of view of their appearance as seen from the ground and from that of the physica processes forming them is reviewed. The author surveys critically the history of cloud classification that began with the work of Luke Howard, the system of Poëy who regarded status and cirrus as the only fundamental cloud forms; that of Abercromby and Hildebrandsson which became the basis of the first International Cloud Atlas (1896); the International Cloud Atlas of 1929 which was based upon the Linnaean system of classification and the concept of "unit clouds" proposed by Shaw; the genetical classifications of J. Bjerknes and Douglas Stüve and Petterssen; and the physical classification proposed by Bergeron. Steps towards progress in cloud classification are outlined. These are a more rigorous logical treatment of international definitions; uniform practice involving an official abridgment of the International Cloud Atlas; uniform training methods and outlines of study; and an internationally recognized genetical classification. *Subject Headings:* **1. Cloud classification 2. International Cloud Atlas 3. Compendium articles.**—*I.L.D.*

4.5–8 551.574.1

Ludlam, F. H. (*Imperial Col. of Sc. and Tech. and Met. Off., London*), **The physics of ice clouds and mixed clouds.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 192–198. fig., 24 refs.) **MH-BH**—Ice clouds can be distinguished from water or mixed clouds by fibrous appearance or by virga (Fallstreifen) of the former and solid borders or denser streaks in the case of the latter. Recent ideas on function of ice nuclei in cloud growth and precipitation processes are based on work of KRASTANOV (1940 and 1941), who developed the theory of condensation along the lines of statistical mechanics, greatly altering theories of WEGENER and FINDEISEN. Work of REGENER and WEICKMANN confirms this concept of freezing nuclei. Later work of FOURNIER D'ALBE has shown possibility of having sublimation nuclei acting at low ice-supersaturation. Development of ice phase in clouds is discussed at length, with many quantitative values included to give an idea of the order of magnitude of the various parameters (temperature, supersaturation over ice or water, drop size, vertical velocities, rate of growth, speed of fall, etc.) involved before and after the critical stage has been reached. First the processes involved in *cumulus* or *cumulonimbus* growth are discussed and then those for *middle* and *high level* clouds. Finally, the relation of ice clouds to condensation mechanisms is treated. Forecasting of cirrus cloud thickness or extent is not considered possible until more is known about vertical displacements of air at high levels, and accurate measurements of humidity can be made. Cirrus detached from frontal or convective cloud areas are the hardest to predict. Likeness of particles in cirrus clouds to "Fallstreifen" (large tufts of prisms) is noted. *Subject Headings:* **1. Cloud physics 2. Ice phase 3. Cirrus forecasting 4. Compendium articles.**—*M.R.*

4.5–9 551.58(410)(02)

§Manley, Gordon, **Climate and the British scene.** The New Naturalist, London, **1952.** 314 p. 74 figs., 81 photos, 10 tables.—This book, lavishly illustrated with color prints, black and white photographs, weather maps and diagrams, sets out aspects of British climate as it appears to the land traveller. After historical introductions, Chap. 3 gives a brief account of "some elementary properties of our moist atmosphere"—fog, cloud, precipitation, glaze, stability and instability. Following chapters summarize atmospheric circulation, air masses and weather types, annual variation of temperature and weather of the seasons. Chapters 8–10 deal with landscape and its effect on weather, and 11 with snowfall and snow cover. Two long chapters set out variations of British climate since before the Ice Age and during the instrumental period. Finally, "Climate and man" covers the relations of climate to physical and mental characteristics, livelihood, disease and death-rate, bracing and relaxing climates. Appendices give climatic tables for a number of places in the British Isles. *Subject Headings: Headings:* **1. Climatology 2. Climatic variations 3. Textbooks 4. British Isles.**—*C.E.P.B.*

4.5–10 551.510.5

†Mitra, S. K. (*Univ. of Calcutta*), **General aspects of upper atmospheric physics.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 245–261. 7 figs., 3 tables, 108 refs.) **MH-BH**—Effect of radiation and turbulence on structure of the atmosphere is first considered. Then the outer limit of the atmosphere, the escape of gases (cone of escape), problem of deficiency of helium in atmosphere, the exosphere or fringe region (similar to corona of sun), the solar control of upper atmosphere, effect of solar UV radiation on various atmospheric gases, geometry of illumination of upper atmosphere by sun, etc. accompanied by models and tables, are discussed. Methods of investigation or exploration are next considered. Direct methods (balloon, smoke shell, V-2 rocket, sound and radio), and indirect (meteors, auroras, night sky light, magnetic variations, barometric oscillation, noctilucent clouds and scattering of UV light) are considered systematically. *Subject Headings:* **1. Upper atmosphere physics 2. Outer atmosphere investigations 3. Exosphere 4. Compendium articles.**—*M.R*

4.5–11 551.574.1:551.576.11

Möller, Fritz (*Gutenberg Univ., Mainz, Germany*), **Thermodynamics of clouds.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 199–206.

47 refs.) Translated from German. **MH-BH**—Lack of suitably accurate and responsive instruments for soundings in clouds prevents any rapid progress in knowledge of thermodynamic processes. Heat exchange between cloud and air, conduction, evaporation, radiation, mixing processes in and around the cloud, ascending and descending motions and their relation to the moist adiabatic processes, and recent ideas on entrainment are discussed. The slice method of Bjerknes and Petterssen, cellular convection theories (supported by motion pictures of Mügge), evaporation, condensation, sublimation, droplet accretion, graupel formation and lastly melting processes are discussed. *Subject Headings:* **1. Cloud physics 2. Thermodynamics of clouds 3. Slice method 4. Entrainment 5. Compendium articles.**—*M.R.*

4.5–12 551.588.1

Shuleĭkin, V. V., **Atlanticheskie vody i klimat SSSR.** [Atlantic waters and the climate of U.S.S.R.] *Akademiia Nauk, SSSR, Izvestiia, 7 Ser., Otdelenie Matematicheskikh i Estestvennykh Nauk*, No. 8/9:997–1020, **1935.** 19 figs., 13 maps, 8 refs., 31 eqs. **DLC**—The advective heat flow (ϕ) on the earth's surface can be expressed by $\phi=\phi_1+\phi_2=AH[\text{grad}_1\,\vartheta+\text{grad}_2\,\vartheta]$ Index$_1$-planetary values, index$_2$-characteristic values for the heat exchange between ocean and continent; A—large scale exchange coefficient, H—"effective" thickness of the atmosphere, ϑ—temperature. The author obtains the value $AH=1.28\times10^{20}$ cal cm^{-1} year$^{-1}\,\frac{\text{grad}}{\text{cm}}$ on the basis of the planetary heat budget, assumes that AH is constant for all regions and seasons and calculates the seasonal heat flow using carefully prepared anomaly charts of temperature for the territory of the Soviet Union, which are presented for each month and the year. An important result of the theory, verified by the results of observations is $\tau=\tau_0 e^{-\beta x}$ and $\left|\frac{\partial\tau}{\partial x}\right|=\beta\tau$. τ=magnitude of anomaly (for an ideal continent $\tau=0$) x=distance from the ocean, $\beta=\frac{2}{R\sin\varphi}$. The gradient of the anomaly depends only on τ, the earth radius R and the latitude φ. The maps and calculations show the great influence of advective heating from the Atlantic Ocean and the Arctic Sea. *Subject Headings:* **1. Large scale exchange 2. Marine influences 3. Temperature anomalies 4. U.S.S.R.**—*A.A.*

4.5–13 551.501.83:551.515.4

†Wanta, Robert Casimir (*U. S. Weather Bur., Upton, N. Y.*), **Sferics.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1297–1300. 41 refs.) **MH-BH**—The subject of this review is the sferics found at a distance from "sudden electrical discharges resulting in distribution of charge within and between clouds, between clouds and the air space above or below, and between clouds and earth." The author reviews the history of the observations of sferics and their relation to thunderstorms; the direction finding system of Watson-Watt and Lutkin; the accuracy of determination of bearings of sferics; and the value of sferics to meteorologists, particularly their use in detecting thunderstorms and in weather forecasting. *Subject Headings:* **1. Sferics 2. Thunderstorms 3. Storm detection 4. Compendium articles.**—*I.L.D.*

GENERAL METEOROLOGY

4.5–14 551.5(03)

Bellisario, Amerigo, **Terminologia meteorologica in italiano, inglese, francese e spagnolo.** [Meteorological terminology: in Italian, English, French and Spanish.] *Rivista di Meteorologia Aeronautica*, 11(2):63–78, April/June, **1951.** Also published as a separate by: Italy. Servizio Meteorologico per l'Aeronautica. **DWB**—A tentative but useful concordance of 400 meteorological terms and another 400 phrases alphabetized in Italian, with equivalents in English, French and Spanish. The terms listed are mainly the general and special terms used in synoptic observation, transmission of reports, analysis and forecasting and aeronautical meteorology. *Subject Headings:* **1. Glossaries 2. Meteorological terminology 3. Italian-English-French-Spanish glossaries.**—*M.R.*

4.5–15 551.5(03):495

Rose-Innes, Arthur, **Beginners' dictionary of Chinese-Japanese characters.** American ed. from the 2nd enl. ed. of 1927. Cambridge, Harvard University Press, **1950.** 507 p. Price: $3.00. **DWB**—An estimated total of 20,000 words, including compounds, are contained in this dictionary. Slightly less than 5,000 characters have been used. They are arranged under the conventional 214 "radicals." Geographical and other proper names, Japanese measures and weights, chronological series and basic meteorological terms are included. An analysis of radicals and of abbreviations is offered. Pronunciations are indicated in transliterated form. Most of the more complete Japanese-English dictionaries available are arranged in alphabetical order of the spoken words, however, this dictionary is among the very few which can be directly used in identifying the meaning and pronunciation of a major portion of the vocabulary encountered in Japanese meteorological papers. *Subject Headings:* **1. Dictionaries 2. Japanese language.**—*G.T.*

4.5–16 551.5(058)(435)

Germany. Meteorologisches Amt für Nordwestdeutschland, **Bericht über die Tätigkeit im Jahre 1951.** [Report on activity, 1951.] Hamburg, **1952.** 24 p. 2 plates. **DWB**—Reports of work of the Central Office in Hamburg and branches in Schleswig, Bremen, Hannover and Essen-Mülheim, list of publications and charts of stations and forecast districts. *Subject Headings:* **1. Annual reports 2. Northwest Germany.**—*C.E.P.B.*

4.5–17 551.5(058)(41)

Great Britain. Meteorological Office, **Annual report of the Director . . . for the year April 1, 1951 to March 31, 1952.** London, H.M.S.O., **1952.** M.O. 562. 54 p. **GB-MO**—Includes: Functions of Meteorological Office; Forecasting services; Reports of work on British and World climatology; Marine and agricultural meteorology and Upper air climatology. Under "Research and development" are included work of Meteorological Research Committee, Gassiot Committee, etc., instrument development, and research in forecasting and physical meteorology. Publications by members of the staff are listed. *Subject Headings:* **1. Annual reports 2. British Isles.**—*C.E.P.B.*

4.5–18 551.5:016:019.941(46)

†Campmany, Maria, **Bibliografia de la meteorologia Catalana.** [Bibliography of Catalan meteorology.] *Catalonia. Servei Meteorològic, Notes d'Estudi*, No. 68:399–523, **1937. DLC**—A compilation of 718 annotated and classified (U.D.C.) references to meteorological works in Catalan or by Catalonian authors, arranged alphabetically by author; with a subject and a geographic index and a Catalan version of the I.M.O. Universal Decimal Classification for meteorology appended. The citations cover the period 1788–1937 and are very carefully edited. *Subject Headings:* **1. Bibliographies 2. Abstracts 3. Meteorological terminology 4. U.D.C. for meteorology 5. Catalan language 6. Catalonia 7. Spain.**—*M.R.*

4.5–19 551.5:016

†France. Centre Nationale de la Recherche Scientifique, **Bulletin Analytique. Pt. 1, Mathématiques, physique, chemie, sciences de l'ingénieur.** [Analytical Bulletin. Pt. 1, Mathematics, physics, chemistry and engineering sciences.] Paris, Centre de Documentation du C.N.R.S. Vol. 1, published **1940.** Last issue received, v. 13(1), **1952.** Price: 5.000 fr. **MH-BH**—This voluminous annotated bibliography contains in each issue a section on Physics of the Earth, of which Sec. IV. Oceanography, Sec. V. Hydrography, Sec. VI. Atmospheric Physics, Sec. VII. Meteorology, Sec. VIII. Upper Atmosphere, and Sec. IX. Terrestrial Magnetism, are of interest to meteorologists. In one issue these sections comprise about 14 pages and 200 entries. *Subject Headings:* **1. Periodicals 2. Bibliographies 3. Abstracts 4. Geophysics 5. French language.**—*M.R.*

4.5–20 551.5:016(71) 551.46:016

†National Research Council of Canada, **Bibliography of Canadian Geophysics 1951** [and] **Canadian Bibliography of Geodesy.** *Canadian Geophysical Bulletin*, Ottawa, 4(4), [Nov. 15, **1951.**] 49+10 p. **DWB**—Contains references and abstracts (many original and some

copied) of 49 current papers on meteorology, 14 on hydrology, 11 on oceanography and 15 on atmospheric ionization written by Canadians or of special interest to Canada. *Subject Headings:* **1. Bibliographies 2. Meteorology 3. Oceanography 4. Canada.**—*A.A.*

4.5–21 551.5:016(438)

Zych, Stanislaw; Parczewski, W. and Stenz, Edward, **Zestawienie polskiej literatury naukowej powojennej z zakresu meteorologii (1944–1950).** [A catalogue of Polish postwar scientific literature in the field of meteorology (1944–1950).] *Przegląd Meteorologiczny i Hydrologiczny*, v. 1950/1951:346–351, **1951. DWB**—Ninety-six items, containing books and articles from this field, written by Polish meteorologists in seven languages: Polish, English, French, Spanish, Hungarian, Italian and German. *Subject Headings:* **1. Bibliographies 2. Progress in meteorology 3. Poland.**—*W. Tomczykowski.*

4.5–22 312.2:551.5(73)

Metropolitan Life Insurance Company, **Catastrophic accidents—the record for a decade.** *Metropolitan Life Insurance Company, Statistical Bulletin*, 32(6):7–10, June **1950.** tables. **MH-BH**—A comparison of number of catastrophic accidents and lives lost in U. S. 1941–45 and 1946–50. Out of 1,050 "accidents" involving 13,213 deaths only 111, with 2,292 deaths, were due to tornadoes, floods, hurricanes, etc. *Subject Headings:* **1. Mortality due to weather 2. United States.**—*C.E.P.B.*

4.5–23 551.5:37:551.501.1:37(439.1)

Aujeszky, László, **Az időjárás megfigyeltetése az iskolai oktatásban.** [Weather observations in high school education.] *Időjárás*, 54(5/6):159–166, May/June **1950.** Trans. in: *Weather*, 7(7):223–224, July **1952. MH-BH**—Second and final installment of an article on meteorological education in Hungarian schools. Proper educational methods are suggested and the use of basic instruments recommended. A definition of some basic synoptic elements is given for use by teachers who—it is deplored—have but limited opportunity to acquire such knowledge during their training, which excludes meteorological instruction as a compulsory course. For the first installment *see item* 2.7–16, July 1951, *MAB*. *Subject Headings:* **1. Teaching of meteorology 2. Hungary.**—*G.T.*

4.5–24 551.5:06:37

Meade, P. J., **Training in the Meteorological Office.** *Meteorological Magazine*, London, 81(959):129–137, May **1952.** 3 photos. **MH-BH**—Training in meteorology cannot begin until a sufficient knowledge of physics and mathematics has been reached. At first it was *ad hoc*, but systematic centralized training began in 1935 and a Meteorological Office Training School was opened Sept. 15, 1939. The organization and courses at the present school at Stanmore are described. They include training in forecasting, original research (mainly synoptic), and short courses for observers, etc. *Subject Headings:* **1. Training in meteorology. 2. Great Britain.**—*C.E.P.B.*

4.5–25 551.537:92

Meteorology in the University of London. *Weather*, 7(11):349–351, Nov. **1952.** plate. **MH-BH**—Account of meteorological life of Prof. Sir David Brunt, who retired on Sept. 30, 1952, and of Prof. P. A. Sheppard who succeeds him. Photo of members of Department of Meteorology at Imperial College, London. *Subject Headings:* **1. Teaching of meteorology 2. Brunt, Sir David 3. Sheppard, P. A.**—*C.E.P.B.*

4.5–26 551.5:550.34

Gutenberg, Beno, **Seismische Bodenunruhe und Wetter.** [Microseisms and weather.] *Umschau*, 52(21):646–648, Nov. 1, **1952.** 4 figs., 2 refs. **DLC**—A summary of instruments, observations and theory. Regular waves of 4–10 sec are variously attributed to cyclone centers (Pacific, used in forecasting), to microbarometric oscillations (Palomar), to local turbulence (Pasadena), onshore breakers (Scandinavia) and, theoretically, to standing waves in deep water. *Subject Heading:* **1. Microseisms.**—*C.E.P.B.*

4.5–27 551.5:629.13

Batty, R. P., **Meteorological observations on a flight by a Canberra jet aircraft from England to Australia.** *Meteorological Magazine*, London, 81(961):218–220, July **1952. DWB**—Remarks by pilot (D. R. CUMING) and navigator on up currents E of Sardinia, cloud tops up to 45,000 ft (much above expected heights) and clear air turbulence (always associated with cirrus) when passing through inversions or tropopause. *Subject Heading:* **1. Aeronautical meteorology.**—*C.E.P.B.*

4.5–28 551.5:91.04(99)

Roots, E. F., **The Norwegian-British-Swedish Antarctic expedition 1949–52.** *Science News*, London, 26:9–32, **1952.** 3 figs., 25 photos.—Includes a brief account of the study of heat transfer at Maudheim on a uniform snow surface through the year, studies of physics of shelf ice and of glacier movement. It is found that the inland ice level has been stable for the past century or so; the climatic implications are discussed. Seismic measurements of ice depth are described. Other brief sections deal with the geology, biology, oceanography, magnetic and auroral observations and physiology. *Subject Headings:* **1. "Maudheim" Expedition 2. Antarctica.**—*C.E.P.B.*

4.5–29 551.5:92

Stenz, Edward, **Profesor Dr. Władysław Gorczyński.** [Professor Dr. Władysław Gorczyński.] *Przegląd Meteorologiczny i Hydrologiczny*, v. 1950/1951:1–6, **1951.** English summary p. 7–10. List of publications by Gorczyński p. 11–15. **DWB**—A biography of the scientist and a list of published works and books of the well-known Polish meteorologist. *Subject Headings:* **1. Gorczyński, Władysław 2. Meteorologists 3. Biography.**—*A.M.P.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **4.5–13, Sferics** (Wanta); **4.5–23, Weather observations in high school** (Aujesky); **4.5–44, Samples of forms for reporting observations** (Bergeiro); **4.5–46, Upper atmosphere research with sampling rockets . . .** (Singer); **4.5–48, Thermal and thermodynamic correction for moisture indications of hair** (Sonntag); **4.5–53, Water tank and wind tunnel tests on rain gauge wind shield** (Sanuki, Tsuda, Kimira); **4.5–55, Comparison of mean temp. obtained with Canadian and American radiosondes** (Henry); **4.5–59, Automatic meteorological stations** (Perlat); **4.5–152, New value of Hann's constant for calculating vapor pressure as function of atmospheric pressure** (Röhl); **4.5–162, Abridged cloud atlas; 4.5–168, Precip. chart of Spain** (Gonzales Quijano); **4.5–178, Criteria for estimating runoff from snow melt; 4.5–205, Microclimatology in Belgrade Meteorological Observatory,** (Radosevic).

4.5–30 551.501.1(02):551.583.15(058)

Amateur Weatherman's Almanac, 1952. Philadelphia, Pa., Pub. by Weatherwise, **1953.** 72 p. illus. Price: **$1.00. DWB**—An attractive, popular almanac based on actual weather occurrences in 1951, plus a number of interesting facts and statistics (weather extremes, normals for 225 cities, unusual rainfalls, etc. and an informative discussion of air masses, storms, fronts, hurricanes, individual and synoptic forecasting), lists of recent popular books on weather, publications of the U. S. Weather Bureau, description of hurricanes in 1951 and, finally, 15 pages of blank forms for amateur observers to fill in (twice daily) on the sky conditions, temperature, humidity, barometer, wind and precipitation, and to make monthly and annual summaries. Instructions for observing and recording are included. *Subject Headings:* **1. Amateur observers manuals 2. Climatic extremes 3. Observation forms 4. Almanacs 5. United States I. Amateur Weathermen of America, Philadelphia.**—*M.R.*

4.5–31 551.501.3:551.577

Usami, T., **Local-climatological research for agriculture; (Pt. I.) an interpolation method of precipitation.** *Japan. Central Meteorological Observatory, Tokyo, Memoir of Industrial*

Meteorology, 16(1):47–58, Aug. **1952.** 6 figs., 4 tables. In Japanese; English summary p. 3. **MH-BH**—A method for estimating precipitation in places for which records are not available, is described. It is based on topographic factors and mode of precipitation. Yamagata Perfecture is divided into two major pluviometric areas and the author's method is applied to one of these regions. *Subject Headings:* **1. Precipitation estimation 2. Yamagata Perfecture, Japan.**—*G.T.*

4.5–32 551.501.9(058)

Blue Hill Meteorological Observatory, [**Report on**] **Blue Hill Meteorological Observatory.** Reprinted from the Report of the President of Harvard College and Reports of Departments, 1950–1951. *Blue Hill Meteorological Observatory, Reprint*, No. 1, **1952.** 13 p. **MH-BH**—A detailed account of the many scientific studies, contract activities and services performed by the Library and personnel of Blue Hill Observatory. A list of donations from various individuals, and a list of publications of members of the staff are included. *Subject Headings:* **1. Blue Hill Observatory 2. Annual reports 3. Meteorological research. I. Brooks, Charles F.**—*M.R.*

4.5–33 551.501.9:551.501.7

Huss, Eduard, **Aerologie im Bodenseegebiet.** [Aerology in the region of Lake Constance.] *Naturwissenschaftliche Rundschau*, 5(10):409–413, Oct. **1952.** 5 figs., 7 refs. **DWB**—An account of the aerological observatory at Friedrichshafen (built in 1908), the auxiliary lake steamer and the researches carried on into lake and lake-shore meteorology, micro-physics of cloud, etc. *Subject Headings:* **1. Observatories 2. Friedrichshafen, Germany.**—*C.E.P.B.*

4.5–34 551.501.9:551.43(794)

Pace, Nello and Coo, S. F. (*Univ. of California, Berkeley*), **California's laboratory above the clouds.** *U. S. Office of Naval Research, Research Reviews*, March **1952.** p. 1–7. 3 figs. **DWB**—A research center in the White Mountains, central California, is described. The station was erected by the Naval Ordnance Test Station, Inyokern, at an altitude of 10,500 ft and is being used for atmospheric, physical and biological investigations. Research on cosmic radiation, on the relative purity of air, on temperature, etc. carried on by the California Institute of Technology, under an ONR contract, is reported. Details concerning the station's installations, administrative and supply problems and personnel are given. *Subject Headings:* **1. Mountain observatories 2. Cosmic ray research 3. White Mountains, California.**—*G.T.*

4.5–35 551.501.9:522:551.506.1

The Royal Greenwich Observatory. *Engineering*, London, 172(4467):309–310, Sept. 7, **1951. DLC**—Account of recent construction work, recordings and improvement of instruments carried on at Greenwich Observatory. It is pointed out that the transfer of the Observatory to a new site at Herstmonceux is unlikely to be completed by the end of 1953 as originally planned. Weather records for the year May 1, 1950–April 30, 1951 show exceptionally wet weather with below-average sunshine. *Subject Headings:* **1. Greenwich Observatory 2. Astronomical observatories 3. Weather. 4. England**—*G.T.*

4.5–36 551.501.9

Sukawa, Tsutomu, **To greet the 50th anniversary of Meteorological at Mizusawa Latitude Observatory.** *Iwate Meteorological Association, The Review*, p. 39–41, Nov. **1951.** In Japanese. English summary, append. p. 5. **DWB**—Regular observation of latitude at Mizusawa Observatory was started on Dec. 11, 1899 and a full set of equipment for meteorological observation was installed in Nov. 1901. Regular meteorological observation has been in progress since Jan. 1, 1902 and consequently continuous records are available for a period of 50 years. *Subject Headings:* **1. Mizusawa Latitude Observatory 2. Meteorological observatories 3. Japan.**—*G.T.*

4.5–37 551.501.9:550.38(436)

Trapp, E., **Die Wiedererrichtung der Magnetwarte Wien-Auhof.** [The reconstruction of the Magnetic Observatory Wien-Auhof.] *Wetter und Leben*, Vienna, 3(11/12):268, Dec. 1951. **MH-BH**—The Wien-Auhof Magnetic Observatory was established in 1928 in connection with the third magnetic survey of Austria. It was destroyed in 1945 but was restored in 1949/50. Its present layout and equipment are described briefly. *Subject Headings:* **1. Magnetic observatories 2. Vienna-Auhof Observatory 3. Austria.**—*I.L.D.*

OBSERVATIONAL DATA

See also: 4.5–35, **Royal Greenwich Observatory;** 4.5–97, **Tropical cyclones, New Caldeonia, 1852–1951** (Giovanelli); 4.5–98, **Typhoon "Kitty" and "Della";** 4.5–146, **Measurement of wind for wind power survey, India** (Ventkiteshwarran); 4.5–168, **Precip. chart of Spain** (Gonzales Quijano); 4.5–178, **Criteria for estimating runoff from snow melt.**

4.5–38 551.506.1(43)551.525 551.521.12

*Germany. Deutsche Demokratische Republik. Meteorologischer Dienst, **Deutsches Meteorologisches Jahrbuch, Teil IV, Heft I, Beobachtungen des Meteorologischen Hauptobservatoriums Potsdam.** [German Meteorological Yearbook, V. 4, Pt. 1, Observations of the Potsdam Meteorological Observatory.] First issue received **1939** (pub. 1951). Last issue received **1950** (pub. 1952). 2 pieces mostly. **DWB**—Summary of Potsdam Observatory observations made at 7, 14 and 21h. Beginning 1949, V. 4, Pt. 1, Yearbook includes an Appendix: **Beobachtungsergebnisse der Strahlungsforschungstelle Goths.** [Results of observations at the Goths radiation investigation station.] Pressure, temperature, vapor pressure, relative humidity, wind, visibility, cloudiness (0–10), weather, precipitation and snow cover for each day of the year, plus 5-day, monthly and annual averages, and detailed observations of miscellaneous phenomena. Hourly values from recordings of pressure, temperature, vapor pressure, relative humidity, wind precipitation, sunshine, cloudiness (bihourly), and 3 times daily soil temperature at 2, 5, 10, 20, 50, 100, 200, 400, 600 and 1200 cm depth; evaporation, intensity of solar radiation, potential gradient, frequency of winds and precipitation amounts, and details of instruments and exposures. *Subject Headings:* **1. Observational data 2. Potsdam Observatory 3. Soil temperature data 4. Actinometric data 5. Yearbooks 6. Potsdam, Germany.**—*M.R.*

4.5–39 551.506.1(058)(437) 551.574.42

*Lomnický Štít, Czechoslovakia. Observatória, **Ročenka poveternostných pozorovaní, 1947, 1948.** [Yearbook of meteorological observations, 1947, 1948.] Prague, **1948, 1949.** 2 pieces. photos. entirely tables. In Czech, Slovak and French. *Czechoslovakia. Statni Meteorologický Ústav v Praze [and] v Bratislave, Publikácia, Rad D*, v. 2–3, **1947–1948. DLC**—First parts of the yearbooks contain daily data of temperature, pressure, cloudiness, visibility, wind and precipitation for 7, 14, 21h and means, and also remarks on meteorological phenomena observed at and between observation times. The results of self-recording observations of pressure, air temperature, relative humidity, sunshine duration and wind are presented in the other parts of the issues. Rare photographs of glazed frost deposits are included. *Subject Headings:* **1. Observational data 2. Glaze 3. Yearbooks 4. Lomnický Štít, Czechoslovakia. I. Gregor, A. II. Konček, M. III. Czechoslovakia. Statni Meteorologický Ústav v Praze [and] v Bratislave.**—*N.T.Z.*

4.5–40 551.506.1(058):551.585.7(497.1)

*Yugoslavia. Hidrometeorološka Služba, **Godišnji Inzvještaj Visinskog Meteoroloskog Opservatorija Sljeme, 1950 . . . 1951.** [Annual Report, 1950, of the Mountain Meteorological Observatory at Sljeme.] Zagreb, **1951, 1952.** 19 p. all tables. In Croatian, with Croatian and English headings. **MH-BH**—Contains hourly, daily and monthly data for pressure, air temperature, humidity, cloudiness, sunshine duration, wind, precipitation, etc. during 1950, 1951. This observatory is located at 999 m above sea level. *Subject Headings:* **1. Annual meteorological reports 2. Mountain observatories 3. Observational data 4. Sljeme, Yugoslavia. I. Sljeme, Yugoslavia. Visinskog Meteoroloskog Opservatorija.**—*N.T.Z.*

4.5–41 551.506.1(058)(497.1)

*Yugoslavia. Meteorološka Opservatorija, **Meteorološka osmatranjay Beogradu, 1948–1950.** [Meteorological observations at Belgrade, 1948–1950.] Belgrade, **1952.** 43 p. entirely tables. In Serbian and French. **DWB**—Complete results of observations at 7, 14 and 21h and daily means. Five-day, monthly and annual averages are given for the years 1948–1950. *Subject Headings:* **1. Observational data 2. Annual meteorological reports 3. Belgrade, Yugoslavia.**—*A.A.*

4.5–42 551.506.3:551.509

*Beach, N. E. (*U. S. Picatinny Arsenal, Dover, N. J.*), **Summary of weather conditions at Picatinny Arsenal from 1926 to 1950, Report No. 1.** *U. S. Picatinny Arsenal, Dover, N. J., Technical Report,* No. 1840, Sept. **1951.** 10 p. 13 tables, 7 graphs. **DWB**—To provide the weather data required by administrative, manufacturing and engineering activities of the arsenal, records of temperature, relative humidity and precipitation were kept for 25 years and totals and averages computed. It is hoped the data may be of some forecast value. Tables and graphs are included. *Subject Headings:* **1. Climatic data 2. Weather forecasting 3. Long period records 4. Dover, New Jersey.**—*M.P.K.*

4.5–43 551.506.3:551.507.2(261)

*Gordon, A. H. and Barlow, E. W., **Summary of weather and currents at the original Ocean Weather Stations "Item" and "Jig."** *Marine Observer,* 22(156):91–98, April **1952.** 7 figs., 3 tables. **DWB**—Graphs show for 53°50′N, 18°40′W and 60°N, 20°W for each month Aug. 1947–March 1950, mean and extreme air temperatures, mean daily range, sea and air-sea temperatures, mean pressures and wind speeds. Tables give frequencies of wind force 10+, and monthly visibilities. A brief account of currents is included. *Subject Headings:* **1. Ocean weather stations 2. Marine meteorological data 3. North Atlantic.**—*C.E.P.B.*

4.5–44 551.506.8:551.501

Bergeiro Hargain, José María, **A proposito de los dos nuevos modelos de planillas.** [On the two new samples of forms for reporting observations.] *Revista Orientación Meteorólogica,* Montevideo, No. 6:34–37, Aug. **1951.** fold. forms. **DWB**—Two new forms (Nos. 3 and 4) prepared by the Sociedad Meteorológica at Montevideo, for meteorological and phenological observation without instruments (and a third, unnumbered form) are described and attached. The forms for meteorological observation provide for entries of daily values of temperature, precipitation, visibility, cloudiness, wind, etc. Instructions for the prediction of weather are given, including some weather maxims and directions regarding the evaluation of the behavior of animals, of the development of plants and of lunar influences. The phenological form provides for monthly observation of plant development. *Subject Headings:* **1. Observation forms 2. Phenological observations.**—*G.T.*

INSTRUMENT CARRIERS

See also: **4.5–43, Weather and currents from weather stations "Item" and "Jig"** (Gordon, Barlow); **4.5–50, Sampling water droplets in nocturnal clouds and radiation fog** (Mazur).

4.5–45 551.507.321

Misselwitz, Wolfgang (*Radiosonden-Hauptstelle Berlin-Rummelsburg*), **Untersuchungen an Ballonfolien.** [Investigation of balloon foils.] *Zeitschrift für Meteorologie,* 6(8):245–252, Aug. **1952.** 6 figs., 4 tables, 2 refs. **MH-BH**—As a result of three years of high altitude balloon performance tests, two tables are presented—one giving volume, linear expansion and thickness of rubber balloons as functions of height (up to 30 km), balloon weight (0.5, 1.25 and 2 kg) and speed of ascent and the other listing pull stress and molecular extensibility for various heights. The values given in the tables are discussed in detail. Bursting thickness, molecular extensibility and pull stress resistance are indicated as chief criteria of balloon quality. Effects of ultraviolet radiation, of light and of temperature are considered. The

ıethod used in making the tests is described. The effect of a balloon's form on its performance s analyzed. *Subject Headings:* **1. High altitude balloons 2. Balloon research.**—*G.T.*

4.5–46 551.507.362:551.501.7(09-

Singer, S. F. (*Office of Naval Res., U. S. Embassy, London*), **Research in the upper atıosphere with sounding rockets and earth satellite vehicles.** *British Interplanetary Society, Journal,* 11(2):61–73, March **1952.** photos. **DLC**—Importance and posibilities of the use of ockets for research in the fields of astrophysics, geophysics, nuclear physics and aerodynamics re discussed. The history of upper atmosphere research in the U. S. since its start in 1945 is utlined and some of its results mentioned. Aerobee, V-2 and Viking rockets are shown in hotos and diagrams. The author concludes by venturing a "step forward in upper atmosphere research" and introducing the artificial satellite which he particularly recommends as n ideal site for measurement of primary solar and cosmic radiation. *Subject Headings:* **. Rocket soundings 2. Upper atmosphere research 3. History of meteorology 4. Artificial atellites.**—*G.T.*

INSTRUMENTS

See also: 4.5–81, **Composition of organic portion of aerosols, Los Angeles** (Mader and others); 4.5–82, **Air pollution, Los Angeles County** (Magill, Benoliel); 4.5–128, **Method of controlling natural soil temp. gradients** (Platt); 4.5–159, **Detection and measurement of aerosol particles** (Vonnegut).

4.5–47 551.508.25:551.521.61

Oetjen, R. A., Hayne, W. H., Ward, W. M., Hansler, R. L., Schauwecker, H. E. and Bell, E. E. (*Ohio State Univ., Columbus, Ohio*), **An infrared spectrograph for use in the 40–150-micron spectral region.** *Optical Society of America, Journal,* 42(8):559–566, Aug. **1952.**) figs., 35 refs. **DWB**—Problems relating to the design of a far infrared spectrograph are liscussed. The design of a spectrograph which was constructed is described. A platinum trip coated with thorium-oxide is used as a source. Discrimination against short wave adiation is provided by quartz, paraffin, turpentine soot, a compensated potassium bromide hopper, reststrahlen plates, and a grating (used as a reflection filter) with groove separation omewhat less than the wavelength being investigated. As a dispersing device, an echelette rating ruled with 180 lines per inch is used. The detector is a Golay pneumatic cell. A low ıoise vacuum-tube amplifier renders the signal from the detector suitable for operation of a trip-chart recorder. The spectrograph is evacuable. Spectral operating characteristics of the nstrument are shown in ammonia and atmospheric water vapor spectra in the region between 45 and 150 microns. Absorption lines separated by less than 1 cm^{-1} are well resolved throughıut this spectral region. *Subject Headings:* **1. Infrared spectroscopy 2. Spectrographs 3. Water vapor absorption bands.**—*Authors' abstract.*

4.5–48 551.508.71:551.501.42

Sonntag, D. (*Geophysikal. Inst. Leipzig*), **Die thermische and thermodynamische Korrekıion der Feuchteangaben des Haares.** [Thermal and thermodynamic correction for moisture ndications of hair.] *Zeitschrift für Meteorologie,* 6(8):231–237, Aug. **1952.** 5 figs., 3 tables, 7 eqs. **MH-BH**—A thermodynamic correction introduced earlier by M. Robitzsch is discussed ınd represented in a table and a diagram. The correction is a function of pressure and temperature. In addition to this thermodynamic correction, a table and a graph of thermal correction are presented and discussed. This latter permits a correction for the thermal expansion of hair. Finally, the two corrections are combined into a single diagram giving both thermodynamic and thermal correction for humidity readings of hair hygrometers. *Subject Headings:* **1. Hair hygrometers 2. Correction tables.**—*G.T.*

4.5–49 551.508.74(569.4)

Duvdevani, S. (*Dew Res. Station, Post Karkur, Israel*), **Dew observations and their significance—new methods in dew estimation.** (In: United Nations Scientific Conference on the Conservation and Utilization of Resources, Lake Success, N. Y. 1949, **Proceedings, v. 4, Water resources,** p. 45–47. **1951.** 11 refs.) **DWB**—Report on dew observations in Israel.

The standard observation level is 100 cm above ground. A standard instrument (called "dew gauge"), made of wood and specially treated, is exposed from sunset to sunrise. The optical appearance is recorded by day photographs. *Subject Headings:* **1. Dew observation 2. Drosometers 3. Dew effects 4. Israel.**—*A.A.*

4.5–50 551.508.765:551.507.352

Mazur, J. (*Brit. Rayon Res. Assoc., Manchester*), **On the sampling of water droplets in natural clouds and in radiation fogs.** *Physical Society of London, Proceedings*, Pt. 6, 65(390B):457–458, June 1, 1952. 13 refs. **DWB**—Referring to MASON and LUDLAM (*see item* 3.3–173, March 1952, *MAB*), MAZUR describes the technique of capturing water droplets on glass slides coated with a mixture of light mineral oil and vaseline, briefly exposed from an aircraft. Other methods are briefly referred to. *Subject Heading:* **1. Drop size distribution instruments.**—*C.E.P.B.*

4.5–51 551.508.765

†Murgatroyd, R. J., **Methods of measuring liquid water content in cloud.** *Great Britain. Meteorological Research Committee, M.R.P.*, 737, June 13, 1952. 8 p. 19 refs. Mimeographed. **DWB**—The stringent instrumental requirements for use in aircraft are summarized. Existing methods discussed include: impaction, absorbent cylinders, capillary collector, resistance of absorbent paper, rotating cylinders, rotating disk, orifice type icing-detectors, heated wires or cylinders, heated intake and hygrometer, transmitted or scattered light, etc. *Subject Headings:* **1. Cloud meters 2. Icing instruments.**—*C.E.P.B.*

4.5–52 551.508.77

Reinders, Harm R., **The ACG rain-gauge, a simple but practical instrument.** *Weather*, 7(12):388, Dec. 1952. fig. **MH-BH**—Description with photo of a vase-shaped gage graduated in mm. *Subject Heading:* **1. Rain gages.**—*C.E.P.B.*

4.5–53 551.508.77:551.501.1

Sanuki, M., Tsuda, N. and Kimura, S., **Water tank and wind tunnel tests on rain gauge wind shield.** *Papers in Meteorology and Geophysics*, Tokyo, 3(1):54–63, March 1952. 17 figs., ref. **MH-BH**—Two types of wind shield for rain gage, i.e., conical and hollow ring-shaped designs were tested in combination with integral and separated equipment housings, both in a water tank and in a wind tunnel. Flow patterns were photographed by means of aluminum powder spread over the water surface of the tank, or wool strings tied to the model in the wind tunnel. The conical wind shield with a flat circular edge combined with separated housing is found to be the most satisfactory, giving uniform horizontal flow and generating the minimum of eddies around the rain gage funnel mouth. *Subject Headings:* **1. Rain gage shields 2. Instrument comparisons.**—*Author's abstract.*

4.5–54 551.508.822

Eriksson, T. O., **Om felaktigheter vid Meteorografflygmingar samt Riktlinjer för deras Avhjalpände.** [On errors in meteorograph flights and rules for their corrections.] *Uppsala. Universitetet. Meteorologiska Institutionen, Meddelande*, No. 7, **1944.** 52 p. 19 figs., 7 tables, 15 refs. In Swedish, English summary p. 50–51. Price: kr. 2:50. **DWB**—A thorough study of the errors involved in airplane meteorograph soundings as made in Sweden, and comparison of airplane soundings with Väisälä radiosonde observations. The details of construction, mounting and calibration are given and illustrated, and results of comparisons shown in elaborate tables. Conclusion is that motion of airplane raises temperature 1.4°C, and mounting should be such as to avoid exhaust propeller and aerodynamic heating from wings. A new calibration device for securing accurate base lines is described. *Subject Headings:* **1. Airplane meteorograph errors 2. Radiosonde calibration 3. Instrument comparisons 4. Sweden.**—*M.R.*

4.5–55 551.508.822:551.501.7(71)

Henry, T. J. G., **A comparison of mean temperatures obtained with Canadian and American types of radiosondes.** *Canada. Meteorological Div., Cir.*, 2041, Tec. 103, Nov. 23, 1951.

17 p. 3 figs., 5 tables, refs., eqs. **DWB**—Canadian type radiosondes are used at 8 stations in Canada (Aklavik, Baker Lake, Coppermine, Fort Nelson, The Pas, Port Hardy, Moosonee and Sable Island). A comparison of the accuracy of Canadian and U. S. type radiosondes was made by plotting mean temperature at 300, 500 and 700 mb levels on maps for each month in 4-year period 1946–49, drawing isotherms based on U. S. radiosonde data from U. S., Canada, Alaska, and Greenland, and computing amount of temperature and height difference resulting. At night, the Canadian radiosonde gave consistently higher temperatures than the U. S. type, indicating greater lag. Daytime ascents showed greater radiation error in Canadian instruments, besides the cumulative lag effect noted at night. However, radiation error is small. Tables are given to permit corrections to be applied to radiosonde data (or charts) for lag, radiation error at various solar altitudes, lapse rates and sky conditions. Theory is elaborated and scatter diagrams presented. *Subject Headings:* **1. Radiosonde errors 2. Canadian radiosondes 3. Radiosonde networks 4. Radiosonde comparisons 5. Canada.**—*M.R.*

4.5–56 551.508.822

Sanuki, M., Tsuda, N. and Kusano, A., **Tank test of radiosonde ventilator tubes,** *Papers in Meteorology and Geophysics*, Tokyo, 2(2):196–204, June **1951.** 14 figs., 6 refs. **MH-BH**—A description of a towing water tank for testing quantitatively as well as qualitatively the flow pattern of meteorological instruments and its application to radiosonde ventilator tubes of the improved CMOS-48 radiosonde. The method of experimentation and the flow pattern of converging and diverging channels are described. The duct velocity distribution, the period of cycle flow patterns and the effect of the end plate and the deflecter were determined. A relationship exists between the tank test and wind tunnel experiments through the Reynold's number. *Subject Heading:* **1. Radiosondes.**—*I.L.D.*

4.5–57 551.508.822:621.398

Siderman, Joseph A. (*Signal Corps Eng. Labs., Ft. Monmouth, N. J.*), **Radiosonde telemetering and recording system.** *Tele-Tech*, N. Y., 10(11):40–41, 86; 10(12):54–55, 77, Nov.–Dec. **1951.** 8 figs. **DLC**—AN/AMT-3 radiosonde equipment which is launched from high-altitude aircraft, descends at 2000 ft/min and transmits pressure, temperature and humidity data is described and shown in photos. An automatically synchronized recorder recently developed by Evans Signal Lab., U. S. Signal Corps and Times Facsimile Corp., N. Y. City, is described in detail and its operation explained. Photos, block diagrams and a circuit diagram of the recorder are presented. *Subject Headings:* **1. Telemetering systems 2. Dropsondes 3. Radiosonde recorders.**—*G.T.*

4.5–58 551.508.824

Free floating automatic weather station. *Telegraph and Telephone Age*, New York, No. 4:18, 20, April **1952.** illus. **DLC**—A buoy-type weather station developed by the National Bureau of Standards is described. The 27-foot apparatus weighing 280 pounds and consisting of a timing mechanism, weather responsive devices, self-contained batteries, a relaxation or keying oscillator and a radio transmitter, communicates data on air and water temperature, air pressure and wind speed and direction up to a distance of 400 miles. A photo of the apparatus is presented. *Subject Headings:* **1. Automatic weather stations 2. Recording equipment.**—*G.T.*

4.5–59 551.508.824:551.501

Perlat, A., **Les stations météorologiques automatiques.** [Automatic meteorological stations.] *La Météorologie*, 4th Ser., No. 11:196–210, July/Sept. **1948.** 7 figs. **DWB**—Description of American, Canadian, German and proposed French automatic weather stations. Requirements of automatic weather stations in general and the history of development of such equipment as well as of the radiosonde, the differences between the radiosonde and the automatic weather stations, and the details of constructions of the U. S. Navy automatic stations are given, and ample illustration included. A station in the Caribbean for hurricane warning, a station on a buoy in Lake Ontario for fog forecasting and those used by the Germans during the war on buoys at sea and at Arctic land stations are described. *Subject Headings:*

1. Automatic weather stations 2. Radiosondes 3. Observation techniques 4. Marine instruments.—*M.R.*

4.5–60 551.508.93:551.521.63:535.33

Bezverkhniĭ, Sh. A., Osherovich, A. L. and Rodionov, S. F., **Elektrofotometricheskie issledovaniia prozrachnosti atmosfery v ul'trafioletovoĭ oblasti spektra.** [Electro-photometric investigations of atmospheric transparency in the ultraviolet region of the spectrum.] *Akademiia Nauk, SSSR, Isvestiia, Ser. Geofiz.*, No. 3:93–102, **1952.** 13 figs., 2 tables, 13 refs. **DLC**—Methods and apparatus for determining the ozone content of the atmosphere and for investigating the phenomenon of anomalous transparency at wave length 2850–4000 Å associated with an aerosol component of the atmosphere are described. The apparatus consists of a monochromator of double resolution with an attached photometer. Circuit diagrams and descriptions are given of spectrophotometer with a photoelectric multiplier, of an integral photometer with a photomultiplier for increasing sensitivity and of an integral photometer with a photoelectric cell. The results of measurements of the ultraviolet radiation of the sun and moon and of the phenomenon of anamolous transparency are presented. *Subject Headings:* **1. Electrophotometry 2. Atmospheric transparency 3. Ultraviolet spectrum 4. Ozone measurement techniques 5. U.S.S.R.**—*I.L.D.*

4.5–61 551.508.98:551.586:612

†Pfleiderer, H., **Kritische Betrachtungen über die Abkühlungsgrösse.** [Critical remarks on the cooling rate.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:267–270, **1952.** 19 refs. **DWB**—Development of instruments for measuring cooling rate summarized. Results depend on the physical constants of the apparatus; the error of the Davos frigorimeter is discussed and the Pfleiderer-Buettner frigorigraph described. *Subject Heading:* **1. Frigorimeters.**—*C.E.P.B.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: 4.5–42, **Weather at Picatinny Arsenal, 1926–1950** (Beach); 4.5–105, **Statistics of typhoon velocity** (Takahashi); 4.5–153, **Rate of natural evaporation from shallow ponds** (Ferguson).

4.5–62 551.509.31:551.515.2

Oosawa, Koichiro and Nagayama, Moriyoshi, **3-day forecasting of the typhoon track by the broad-weather analysis.** *Oceanography and Meteorology*, Nagasaki, 5(3/4):70–74, D **1951.** 6 figs., 3 refs. In Japanese, English summary p. 74. **DWB**—The forecasting method developed in this paper is based on information derived from four charts: 1) Forecast-day weather map showing track of typhoon, 2) Chart of deviation from normal of 5-day mean pressure, 3) 5-day pressure change chart and 4) 2-day pressure change chart. These four charts are presented and analyzed for each of six typhoons which occurred during the summer season of 1951. General rules of the development of typhoons are derived from the analysis. *Subject Headings:* **1. Synoptic forecasting 2. Extended forecasting 3. Typhoon tracks 4. Japan.**—*G.T.*

4.5–63 551.509.33:551.515.2(52)

Hiyama, K., **A method of one month forecast of typhoons.** *Journal of Meteorological Research*, Tokyo, 3(9):303–304, July **1951.** fig. In Japanese. **DWB**—Brief report of method based on pressure anomalies. *Subject Headings:* **1. Typhoon forecasting 2. Extended forecasting 3. Japan.**—*M.R.*

4.5–64 551.509.33

Hofmann, Alfred, **Die Zukunft der Wettervorhersage. Ein zentrales Problem der Meteorologie.** [The future of weather forecasting. A central problem of meteorology.] *Umschau*, 52(23):705–708, Dec. 1, **1952.** 2 figs., 2 tables, refs. **DLC**—Owing to nature of atmosphere, forecasting positions of rising or falling air is very complex. The longest possible

precalculation by V. BJERKNES's 6 differential equations is only 5 days. General long-range precasts, e.g., of character of winter are more practicable, depending on much slower changes n position of frontal zones in upper air, but to precalculate them radiation would also have o be considered, a long term program. Forecasting by statistical probability is simpler; the principles are discussed. But the longer the period of forecast, the fewer the cases available as basis, and the harder it is to distinguish real from accidental relations. *Subject Headings:* **. Extended forecasting 2. Seasonal forecasting.**—*C.E.P.B.*

4.5–65 551.509.33

Manohin, V. (*Ljubljana, Yugoslavia*), **Problem dugoročne prognoze vremena.** [The problem of long-range weather forecasts.] *Yugoslavia. Hidrometeorološka Služba. Hidrometeorološki Glasnik*, 2(1/2):80–87, **1949.** graph, 12 refs. In Croatian. **DWB**—Without attempting to suggest a working method for preparing forecasts, the author reviews several methods of long range weather forecasting. Synoptic and numerical methods and methods based on singularities and on analogy are explained and discussed. A graph showing the correlation between temperature, precipitation and the water level of two rivers in Yugoslavia is presented. *Subject Headings:* **1. Long range forecasting 2. Forecasting techniques 3. Correlations 4. Yugoslavia.**—*G.T.*

4.5–66 551.509.33

Hay, R. F. M., **Does a cold autumn have any influence on the winter following?** *Meteorological Magazine*, London, 82(968):42–44, Feb. **1953.** fig., 2 tables. **MH-BH**—Deviations of seasonal mean temperatures at Oxford, 1821-1950, from smoothed decadal means are tabulated for autumn and following winter. No significant relations were found. *Subject Headings:* **1. Seasonal forecasting 2. Oxford, England.**—*C.E.P.B.*

4.5–67 551.509.33(7)

Watanabe, Tadashi, **Outline of the studies on seasonal forecasting in America.** *Journal of Meteorological Research*, Tokyo, 3(9):348–350, July **1951.** In Japanese. **DWB**—Summary of work of WEIGHTMAN, WILLETT, NAMIAS and others in extended forecasting research and applications in the last few years by the U. S. Weather Bureau Extended Forecast Section by use of charts of anomalies in monthly mean pressure at 700 mb. *Subject Headings:* **1. Seasonal forecasting 2. Extended forecasting 3. Monthly mean pressure charts.**—*M.R.*

4.5–68 551.509.34:551.524.36

Klein, M. and Yifrach, Y., **Quantitative forecasting of the daily minimum temperature during the winter months for Lydda Airport, Israel.** *Israel, Meteorological Service, Ser. A, Meteorological Notes*, No. 5, **1952.** 19 p. 9 tables, 13 diagrs., 12 refs. **DWB**—An investigation was made of the relationship between the minimum temperature (T_n) and the air temperature at 17:00 local time (T), the humidity at the same time characterized by wet bulb or the dew point temperature (T_d), the month, cloudiness, force and direction of the wind, maximum temperature before the forecast, the pressure at 17:00 local time and the rate of decrease of the temperature during the afternoon. The following regression formula was chosen: $T_n = aT_d + bt - c$; where, a, b, c are constants, dependent on the month of the year and the wind direction. The multiple correlation coefficient varies between 0.64 and 0.74. Nomograms facilitate the practical application. The statistical constants of the distribution of minimum temperatures are computed (means, standard deviation, skewness, kurtosis, medians, etc.) *Subject Headings:* **1. Objective forecasting 2. Minimum temperatures 3. Statistical studies 4. Lydda Airport, Israel. I. Israel. Meteorological Service.**—*A.A.*

4.5–69 551.509.5:551.515.4

Beebe, Robert G. (*Weather Bur. Airport Sta., Atlanta, Ga.*), **Thunderstorm forecasting in the Atlanta, Ga., area.** *Monthly Weather Review*, 80(4):63–69, April **1952.** 6 figs., 3 refs. **DWB**—A quasi-objective thunderstorm forecasting method worked out at the Atlanta Weather Bureau Airport Station is explained. A combination of seven variables related to the humidity of air masses, their stability and the circulation aloft is used. Scatter diagrams of thunderstorm days plotted as functions of the variables analyzed are presented. The method was

tested on past records and in actual experimental forecasts and showed accuracies up to 81%
Subject Headings: **1. Thunderstorm forecasting 2. Forecast accuracy 3. Atlanta, Ga.**—*G.T.*

4.5–70 551.509.

Crossley, A. F., **Usefulness of forecasts.** *Meteorological Magazine*, London, 81(961):193 197, July **1952.** fig., 3 tables, 3 refs., 4 eqs. **DWB**—An expression is given for the "usefu effort" of operations based on weather forecasts, in relation to forecast accuracies of occurrenc or non-occurrence of an event. Analyses of 2 types of forecast are given and economic valu of forecasts discussed. *Subject Heading:* **1. Forecast verification.**—*C.E.P.B.*

4.5–71 551.509.5:551.509.3(758

George, Joseph Johnson (*Eastern Airlines, Atlanta, Ga.*), **Objective forecasting studies** *American Meteorological Society, Bulletin*, 33(5):199–201, May **1952. MH-BH**—The autho outlines the various steps in making a station forecast by the Eastern Airlines forecasters a Atlanta, the program of forecasting studies carried out by this airline and the requirements t be met for making forecasting studies. *Subject Headings:* **1. Objective forecasting 2. Fore casting techniques 3. Eastern Airlines, Inc. 4. Atlanta, Ga.**—*I.L.D.*

4.5–72 551.509.

Hofmann, Alfred, **Eine Methode zur Prüfung von Vorhersagen auf ihrer wissenschaftlich Leistung.** [A method of checking forecasts by their scientific accuracy.] *Germany. Deut scher Wetterdienst in der US-Zone, Berichte*, No. 38:120–123, **1952.** 4 figs., 2 tables. **DWB**— Describes a method of checking forecasts by correlation coefficients between observed an forecast values (7 day forecasts, maximum and minimum temperature and cloud amount) Successful forecasts were due mainly to persistence. *Subject Headings:* **1. Forecast verificatio 2. Extended forecasting.**—*C.E.P.B.*

4.5–73 551.509.5

Dickey, Woodrow Wilson, **Estimating the daily temperature trace from sunrise to the maximum temperature at Denver, Colorado.** *Denver, Colo., Weather Bureau Airport Station Progress Report*, Nov. **1950.** 5 p. 2 tables, 6 figs. **DWB**—A method for estimating the daily temperature trace from 0530M to maximum was developed for clear days with no change of air mass at Denver. Data, including 2000M raobs and hourly and maximum temperature and cloudiness between 0530 and 1730M, were combined graphically with the dry adiabat i such a way that the "amount of energy necessary to be added to the lower layers to produce any particular temperature T at the surface" can be computed. Delay factors for varying degree of cloudiness will be derived in later studies. *Subject Headings:* **1. Objective forecasting 2. Temperature forecasting 3. Denver, Colo. I. U. S. Weather Bureau.**—*M.P.K.*

4.5–74 551.509.54:551.577.

Diaz, Emilio Luis, **Una ayuda para la previsión de lluvias.** [An aid in forecasting rain.] *Sociedad Científica Argentina, Buenos Aires, Anales*, 153(5):187–199, May **1952.** 4 figs., tables. **DWB**—Rainfall probability for three climatic regions of Argentina is determined a a function of various meteorological elements measured at 0900h. The elements considered are pressure anomaly and tendency, temperature anomaly, wind direction, cloudiness and state of the lower and middle troposphere. Rainfall probabilities are tabulated in conjunction with various values of these elements. Forecasts made on the basis of this statistical method are compared to actual measurements and satisfactory agreement is found. It is believed that such information on rainfall probability will usefully fit into synoptic forecasting practices *Subject Headings:* **1. Rainfall probability 2. Precipitation forecasting 3. Argentina.**—*G.T.*

4.5–75 551.509.54 · 551.558

Kashin, K. I., **Raspredelenie vetra v prostranstve i osadki.** [Wind distribution in space and precipitation.] *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, Informa tsionnyĭ Sbornik*, 1:3–13, **1951.** 4 figs. **DLC**—The author uses divergence and continuity equations to determine vertical velocity of air in different layers for 51 cases. Good agreement is found between the upward motion of the air and the occurrence of precipitation. When the

oisture content of the air is considered, an even better forecast is possible. *Subject Headings:* **Precipitation forecasting 2. Vertical velocities 3. Dynamic meteorology.**—*A.A.*

4.5–76 551.509.54:551.558.2

Riehl, Herbert (*Univ. of Chicago*); Norquest, Kenneth S. and Sugg, A. L. (*U. S. Weather ur., Chicago*), **A quantitative method for the prediction of rainfall patterns.** *Journal of leteorology*, 9(5):291–298, Oct. **1952.** 4 figs., 11 refs., 7 eqs. **MH-NH**—An equation is eveloped relating vertical velocity w_h at height of nondivergence, to density, vorticity and hanges of wind vector with height. Where relative vorticity decreases downstream, w_h is ositive and it is assumed that precipitation will fall. The method was tested using 300 mb harts on 16 days in Oct.–Dec. 1951 with good results. Then prognostic 24-hour precipitation harts were prepared for 14 days using upper wind prognoses and verified well. *Subject leading:* **1. Rainfall forecasting.**—*C.E.P.B.*

4.5–77 551.509.59:551.46:532.59

Great Britain. Naval Weather Service, **Observing, forecasting and reporting ocean vaves and surf.** *Great Britain. Naval Weather Service, Memo*, 147/52, July **1952.** 13 p. figs., 11 diags., 3 tables. Mimeographed. **GB-MO**—1) Observations of wave character- tics—direction, period and height. 2) Waves in the generating area—estimating period and eight from synoptic and prebaratic charts. 3) The decay of swell with distance from generat- ng area. 4) The effect of currents and tidal streams. 5) Wave characteristics in shallow vater. 6) Breaker characteristics—straight beach with fathom lines parallel to the beach.) Reporting wave observations and forecasts. Calculation diagrams are given with examples f their use. *Subject Headings:* **1. Wave forecasting 2. Wave propagation.**—*C.E.P.B.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE—IONOSPHERE

See also: **4.5–2, Atmospheric chemistry** (Cauer); **4.5–6, Atmospheric air composition** (Glückauf); **4.5–10, Upper atmospheric physics** (Mitra); **4.5–129, Geophysical and meteorological changes in period Jan.–April 1949** (Lewis, McIntosh).

4.5–78 551.510.42

Fitton, A. (*Dept. of Scientific and Industrial Research*), **Ash and atmospheric pollution.** *nstitute of Fuel, London, Journal*, 25(144):178–181, July **1952.** 4 figs., 5 refs. **DLC**—The aper gives some indication of the source and magnitude of the pollution of the atmosphere y ash and its associated grits. Methods of measuring the concentration of fly-ash in flue as and of determining the size of the particles are briefly outlined, and methods of reducing tmospheric pollution by means of plant design and control and by the use of dust-extraction quipment are surveyed. The size, nature and amount of ash which is emitted into the tmosphere can vary enormously, according to the type of coal, the type of combustion unit nd whether or not a dust-extractor plant is fitted. *Subject Headings:* **1. Atmospheric pollution ontrol 2. Smoke.**—*From author's abstract.*

4.5–79 551.510.42:061.3

McCabe, Louis C., **Atmospheric pollution.** *Industrial and Engineering Chemistry*, 4(7):89A–90A, 92A, July **1952.** 2 figs., 2 refs. **DWB**—Methods of recording the degree of tmospheric pollution and results obtained by those methods were reported at the Second National Air Pollution Symposium sponsored by Stanford Research Institute and held at Pasadena, Calif., on May 5 and 6, 1952. This paper sums up the information contained in hose reports. Proceedings of the symposium are being prepared for publication between Aug. 15 and Sept. 1, 1952 and will be available at $3.00 each, through the Public Relations Office, Stanford Research Institute, Stanford, Calif. *Subject Headings:* **1. Atmospheric ollution 2. National Air Pollution Symposium. I. Stanford Research Institute.**—*G.T.*

4.5–80 551.510.42:546.1

MacIntire, W. H., Hardin, L. J. and Hester, Winnifred (*Univ. of Tennessee*), **Measuremen of atmospheric fluorine.** *Industrial and Engineering Chemistry*, 44(6):1365–1370, June 1952 3 figs., 8 tables, 6 refs. **DLC**—Rainfall collections at six points were analyzed to measure th periodic washing out of fluorine from the atmosphere in relation to the locations of operation that emit fluoric effluents, and charges of Spanish moss were exposed to measure progressiv intake of fluorine from the atmosphere. The findings demonstrate that these two feasible an economical procedures can be implemented in parallel to establish whether a particular local is subject to atmospheric pollution and the degree of pollution. Through integration wit meteorological records, the determined occurrences of fluorine in the rain waters might indicat the origins of the contaminative effluents. *Subject Headings:* **1. Atmospheric pollutio 2. Fluorine.**—*From authors' abstract.*

4.5–81 551.510.42:551.508.9

Mader, Paul P.; MacPhee, Robert D.; Lofberg, Robert, T. and Larson, Gordon, P. (*Lo Angeles, Calif.*), **Composition of organic portion of atmospheric aerosols in the Los Angele area.** *Industrial and Engineering Chemistry*, 44(6):1352–1355, June 1952. 3 figs., 4 table 18 refs. **DLC**—The fact that only small amounts of pollutants could be collected from th atmosphere has been a handicap in the past to chemists who attempted to analyze them. large mechanical filter, capable of collecting macro size samples of aerosols from the atmosphere was devised. Aerosols collected by means of the large filter were analyzed and found t contain sizable amounts of oxygenated and peroxidic organic materials. It was demonstrate that hydrocarbons constitute a large fraction of the many organic substances emitted into th atmosphere. Hydrocarbons are capable of aerosol formation in the atmosphere and are potent factor in atmospheric pollution. *Subject Headings:* **1. Atmospheric pollution 2. Aeros counters.**—*Authors' abstract.*

4.5–82 551.510.42:551.508.9

Magill, Paul L. and Benoliel, Robert W. (*Stanford Res. Inst., Stanford, Calif.*), **Air pollutio in Los Angeles County.** *Industrial and Engineering Chemistry*, 44(6):1347–1351, June 1952 6 figs., 9 tables, 2 refs. **DLC**—The contribution of combustion products to air pollution i Los Angeles County, which results in biological effects on inhabitants and on certain crops, analyzed qualitatively and quantitatively. Daily amounts of various pollutants discharge by incineration, fuel gas and oil combustion and automobile exhausts are tabulated. Samplin apparatus are shown in diagrams and their operation explained. Photomicrographs of aerosol collected from the atmosphere are presented. *Subject Headings:* **1. Atmospheric pollutio 2. Air sampling and analysis 3. Los Angeles County, Calif.**—*G.T.*

4.5–83 551.510.52(569.4):621.396.

Neumann, J., **Diurnal variation of the subsidence inversion and associated radio wav propagation phenomena over the coastal area of Israel.** *Israel. Meteorological Service, Ser. A Meteorological Notes*, No. 6, 1952. 16 p. 5 figs., table, 10 refs., 20 eqs. **MH-BH**—Mea height, pressure, temperature and humidity of base and top subsidence inversion at Lydd Airport at 1, 7, 13 and 19h were found for July 1945 and diurnal variations computed. I version base-top varied from 678–1101 m at 7h to 486–781 m at 19h and is probably lowe at 17h. Main rises (1–7h) and falls 13–17h) are associated with convergent land and divergen sea breezes. The modified refractive index profiles for radio waves are calculated; the lowes level of the elevated duct and greatest hydrolapse account for the observed optimum propaga tion in the evening. *Subject Headings:* **1. Radio transmission ducts 2. Temperature inver sions 3. Humidity lapse rate 4. Israel.**—*C.E.P.B.*

4.5–84 551.510.535:551.594.1

Baker, W. G. and Martyn, David Forbes, **Conductivity of the ionosphere.** *Natur* London, 170(4339):1090–1092, Dec. 27, **1952.** 2 figs., 19 refs., eqs. Singer, S. F., Maple, F and Bowen, W. A., **Dynamo currents and conductivities in the earth's upper atmosphere** *Ibid.*, p. 1093–1094. fig., 15 refs. **DWB**—By existing theories of ionospheric winds an

ionization, conductivity (calculated as less than 4×10^{-9} emu/cm) cannot account for observed geomagnetic daily variations by dynamo theory, which requires 5×10^{-8} emu/cm. Formulas for various types of conductivity are graphed according to height and latitude and an expression for height-integrated effective conductivity deduced. This gives an adequate current mainly between 110 and 150 km, but near magnetic equator in a shallow layer at 100 km. The second paper describes rocket measurements. At time of maximum ΔH at Huancayo, a very rapid decrease (4 milligauss) was found at 93–105 km interpreted as due to an E–W current in a large horizontal sheet, probably produced by Hall polarization. *Subject Headings:* **1. Ionosphere 2. Atmospheric conductivity. I. Singer, S. F. II. Maple, E. III. Bowen, W. A.**—*C.E.P.B.*

4.5–85 551.510.535:551.524.7

Burkard, Otto, **Die Bildung ionosphärischer Schichten bei beliebiger Temperaturverteilung in der Atmosphäre.** [The formation of ionospheric layers with various temperature distributions in the atmosphere.] *Geofisica Pura e Applicata*, 22(1/2):63–74, Jan./March **1952.** 7 figs., 9 refs. German and English summaries p. 63. **MH-BH**—A review of previous investigations of ionospheric theory and structure is followed by models showing most recent hypothetical temperature distribution with respect to ion production in the two F layers and the intervening high temperature zone. The F_2 layer is, however, always cooler than the F_1 layer. The vertical distribution of ion production from 160–480 km and resulting theoretical temperature profile are shown graphically. *Subject Headings:* **1. F layers 2. Temperature of the ionosphere 3. Ion production.**—*M.R.*

4.5–86 551.510.535:551.590.21

Choudhury, D. C., **Effect of vertical transport of ions caused by solar tides in F2 region.** *Indian Journal of Physics*, Calcutta, 25(1):1–7, Jan. **1951.** 5 figs., 4 refs., 7 eqs. **DLC**—A solution is obtained of the continuity equation of the electrodynamical theory of tides of Martyn for the night time conditions W, neglecting the recombination term. The verbal ionic velocity is assumed to have the general form, i.e., $v=v_0e-y^2\cos(wt+\partial)$, where $w=30°$/hour. Curves depicting the variation of N max,, h max., and h min. with height (reduced) are drawn for values of $y=0.25$, 0.50, 1.00, 1.25 and 1.50. For each value of y variation curves for the hours 0.0, 1.0, 3.0, 5.0 and 7.0 (from the time of maximum upward drift) have been drawn. Curves for the value of $y=1$ generally agree with the observed results. *Subject Headings:* **1. Ionospheric tides 2. Solar influences 3. F2 layer.**—*Author's abstract.*

4.5–87 551.510.535:551.521.63

Clark, K. C., **Ionospheric absorption by N_2 and O_2 of certain extreme ultraviolet solar wave-lengths.** *Physical Review*, New York, 2nd Ser., 87(2):271–276, July 15, **1952.** 3 figs., table, 37 refs., 17 eqs. **DLC**—Measurements are reported of the coefficients of absorption by the gases N_2 and O_2 of the emission of the H Lyman series 2–7, the resonance line 584Å of He(I), and twenty lines of H_2 between 980A and 850A, the atomic lines likely being strong in solar radiation. For an atmosphere of constant relative composition the absorption coefficients are related to the atmospheric height of maximum photoionization and maximum electron concentration by equations which allow for a constant temperature gradient, the inverse square decrease of gravity and a recombination process which may vary with height. With these laboratory measurements for N_2 and O_2 and the known calculated absorption for O, ionosphere layer heights are computed for the simple case which assumes complete O_2 dissociation above 100 km, no N_2 dissociation, and two-body recombination. Although only the first assumption is probably secure, it appears that photoionization is capable of producing layers at heights which agree with observation. *Subject Headings:* **1. Ultraviolet radiation 2. Ionosphere 3. Atmospheric absorption.**—*Author's abstract.*

4.5–88 551.510.535:551.594.7

Davids, Norman, **Theoretical group heights of reflection of 150 kc/s radio waves vertically incident on the ionosphere.** *Journal of Atmospheric and Terrestrial Physics*, 2(6):324–336, **1952.** 6 figs., 4 tables, 6 refs., 28 eqs. **DWB**—"It is found that the rapid changes in polarization near the lower edge of the E-region, called the 'coupling region,' are very effective in

generating reflected waves or pulses under suitable conditions. . . . At a higher level in the layer rapid variations in the index of refraction for one of the characteristic wave components occur in what is called the 'reflection region.'" The theory agrees with experimental results. *Subject Headings:* **1. Ionospheric reflection 2. E layer.**—*Author's abstract.*

4.5–89 551.510.535:594.12

Kelso, John M. (*Penna. State Col., Ionosphere Res. Lab.*), **A procedure for the determination of the vertical distribution of the electron density in the ionosphere.** *Journal of Geophysical Research*, 57(3):357–367, Sept. **1952.** 3 figs., 11 refs., 26 eqs. **DWB**—A procedure is given for the determination of the "true height of reflection" of a radio wave incident vertically on the ionosphere. Since—for a given operating frequency—the electron density required for reflection is easily found, the present procedure allows the electron density to be determined as a function of height. To find the "true height" at some particular frequency, f_v, it is only necessary to take the average of the values of group height measured at a set of predetermined frequencies. These frequencies depend on f_v and the accuracy desired in the results. In scaling standard experimental curves for this work, it was sufficient to use five values except near cusps or steps where double that number was found desirable. The present method is based on the use of the Gauss-Christoffel quadrature formula, which is used for the numerical integration of the well-known integral for "true height" as a function of group height. The restrictions on this integral apply to all of the work contained here and are: (1) The earth's magnetic field is neglected; (2) The effects of collisions are neglected; (3) It is assumed that ray theory may be used; (4) It is assumed that the curve of electron density as a function of height has no maxima or minima in the region considered. *Subject Headings:* **1. Electron density 2. Ionospheric reflection.**—*Author's abstract.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

4.5–90 551.511:532.5

Chandrasekhar, S. (*Yerkes Observatory*), **Convection under terrestrial and astrophysical conditions.** *Astronomical Society of the Pacific, Publications*, 64(378):98–104, June **1952.** plate, 2 tables, eqs. **DLC**—In this semi-popular lecture delivered at the Univ. of California, Berkeley, the author, after explaining the classical theory of convection in terms of Benard convection cells and critical Rayleigh number, analyzes the effect of a magnetic field upon the onset of convection. He chooses the case of mercury at room temperature to demonstrate the inhibiting effect which will increase with magnetic intensity and electric conductivity. It is found that this inhibiting effect should be easily detectable in the laboratory and applies to most terrestrial conditions. The author then analyzes properties of thermal conductivity and magneto-hydrodynamic waves under astrophysical conditions and finds theoretical evidence indicating that "under astrophysical conditions thermal instability does not lead to convection in the usual sense but to overstability." Rapid advances are expected from including considerations of electromagnetic effects into the mathematical analysis of a variety of problems related with the stability of fluid motions. *Subject Headings:* **1. Convection theory 2. Thermal conductivity 3. Electromagnetic effects 4. Fluid dynamics.**—*G.T.*

4.5–91 551.511:551.515.11

Queney, Paul, **Les facteurs mécaniques at thermodynamiques de la cyclogenèse.** [Mechanical and thermodynamical factors of cyclogenesis.] *International Union of Geodesy and Geophysics, Association of Meteorology, Oslo 1948, Transactions*, Vol. 2:152–155, **1950.** Mimeographed. **DWB**—The author examines the importance of the properties of the pre-existing hydrodynamic field or mechanical factors and the liberation of mechanical energy by condensation, radiation, turbulence and thermodynamic factors in cyclogenesis. *Subject Headings:* **1. Cyclogenesis 2. Dynamics of the atmosphere.**—*I.L.D.*

4.5–92 551.511

Watanabe, Tadashi, **The Z-P solenoid.** *Journal of Meteorological Research*, Tokyo, 3(14/15):480–485, Dec. **1951.** 7 figs., 6 refs. In Japanese, English summary p. (31). **MH-**

BH—The relation $Q \doteqdot \frac{1}{\rho\lambda^2} \frac{\partial(\lambda, P)}{\partial(x, y)}$ (where λ is the vertical component of absolute vorticity and P the total pressure) is offered for calculating the horizontal divergence in a homogeneous and incompressible atmosphere. This relation is called the λ-P solenoid and the author suggests that most divergence formulae can be deduced from it. Examples of some of its applications are given. *Subject Headings:* **1. Solenoids 2. Divergence.**—*G.T.*

GENERAL CIRCULATION

See also: **4.5–121, Weather and circulation, June 1952** (Klein).

4.5–93 551.513.1

Arakawa, Hidetoshi (*Met. Res. Inst., Tokyo*), **Kinematics of meandering and blocking action of the westerlies.** *Papers in Meteorology and Geophysics*, Tokyo, 3(1):12–18, March 1952. 3 figs., 8 refs. **MH-BH**—Using a method of dynamic analysis similar to those developed by Rossby, Haurwitz, Craig, Neamtan and Høiland, the author investigates energy, velocity and vorticity in zonal winds associated with stationary perturbations at about 26.5° lat. A simple explanation is offered for the kinematic features of blocks in the middle troposphere. *Subject Headings:* **1. Blocking action 2. Waves in the westerlies.**—*G.T.*

4.5–94 551.513.2:551.557

Namias, Jerome, **The jet stream.** *Scientific American*, 187(4):26–31, Oct. 1952. 5 figs. **DWB**—A general descriptive treatment of the jet stream illustrated by diagrams and a sample chart. Current knowledge is summed up in simple terms. Rossby's and the author's (and his collaborators') own theory on the jet stream as part of the general circulation are explained in non-technical language. In the author's interpretation, jet streams originate in a "confluence of vast streams of equatorial and polar air to great heights" resulting in a localized temperature contrast through a deep layer. It is made clear, however, that no satisfactory theory regarding formation and physical properties of the jet stream has been found as yet. Until this is done the application of observational data to practical meteorology and aviation will necessarily remain imperfect. *Subject Heading:* **1. Jet stream.**—*G.T.*

4.5–95 551.513.2:551.557

Riehl, Herbert, **Northern and Southern Hemisphere jet streams.** *Weather*, 7(12):388, Dec. 1952. **MH-BH**—Referring to *item* 3.5–143, May 1952, *MAB*, author points out that absence of a surface front under a jet stream in Southern Hemisphere is only apparent, due to lack of observations. *Subject Heading:* **1. Jet stream.**—*C.E.P.B.*

ATMOSPHERIC DISTURBANCES

See also: **4.5–4, Cold fronts and thunderstorms** (Faust); **4.5–13, Sferics** (Wanta); **4.5–62, 3-day forecast of typhoon track by broad weather analysis** (Oosawa); **4.5–65, 1-month typhoon forecast** (Hiyama); **4.5–69, Thunderstorm forecasting, Atlanta, Ga.** (Beebe); **4.5–112, Atmospheric Radiation Research Project; 4.5–225, Large-ion variations in atmospheric air during disturbed weather; 4.5–231, Electric charges from ice friction** (Chalmers); **4.5–232, Charge of drops in thunderclouds** (Shishkin).

4.5–96 551.515.13:551.515.8

§Rodewald, Martin, **Die Abhängigkeit der Höhenströmung von der Luftmassenverteilung. Ein Nachtrag zum Neufundland-Hurrikan vom 8.9.1952 (vgl. "Wetterlotse" Nr. 46).** [The dependence of the upper current on air mass distribution. A supplement to the Newfoundland Hurricane of Sept. 8, 1952.] *Wetterlotse*, 47:193–200, Nov. 1952. 2 figs. **DWB**—Since pressure decreases upwards more rapidly in cold than warm air, an upper depression is set up behind a cold front, which influences steering of the depression. This is illustrated by chart of surface pressure and mean temperature 0–5½ km in relation to steering of depression of Sept. 8, 1952 off Newfoundland. *Subject Headings:* **1. Steering 2. Cold fronts.**—*C.E.P.B.*

4.5–97 551.515.2:551.506.3(932)

†Giovannelli, J. (*Chief Eng. Met. Serv., New Caledonia*). **Les cyclones tropicaux en Nouvelle-Calédonie au cours d'un siècle, 1852–1951.** [Tropical cyclones in New Caledonia in the course of the century, 1852–1951.] Nouméa [Pub. by the Meteorological Service of New Caledonia], April **1952.** 25 p. map, diagrs., bibliog. p. 26. Mimeographed. **DWB**—The first part of this report contains an account of the zone of formation of tropical cyclones in the Pacific, their trajectories and velocities, diameter, intensity, associated rainfall, preliminary signs indicating the appearance of a cyclone and the periodicity and frequency of the cyclones of New Caledonia. The second part consists of a chronologically arranged table of all the cyclones that have been recorded in New Caledonia during the period 1852–1951 and a description of the characteristics of each cyclone. Many charts and a bibliography of the climate of New Caledonia are included. *Subject Headings:* **1. Tropical cyclones 2. Long period records 3. New Caledonia. I. New Caledonia. Service Météorologique de la Nouvelle-Calédonie et Dépendances.**—*I.L.D.*

4.5–98 551.515.2(52):551.506.1

***§Report of thé typhoon "Kitty" and "Della."** *Japan. Central Meteorological Observatory, Tokyo, Memoirs,* 35(2):53–217, **1950.** figs., tables, photos. English summary p. (1)–(3). **MH-BH**—Detailed case studies are presented of two typhoons which caused severe damage in Japan. Synoptic conditions including wind observations up to 40,000 ft, are discussed and precipitation data tabulated. *Subject Headings:* **1. Typhoon "Kitty" (1949) 2. Typhoon "Della" (1949) 3. Japan.**—*M.P.K.*

4.5–99 551.515.2(261):629.12

§Rodewald, Martin, **Was lehrt der Neufundland-Hurrikan vom 8. September 1952?** [What can we learn from the Newfoundland hurricane of Sept. 8, 1952?] *Wetterlotse,* 46:177–192, Oct. **1952.** 4 figs. **DWB**—Account of a hurricane which travelled from 27°N 68°W on Sept. 3 to S. Greenland on Sept. 12, with excerpts from ships' reports and radio warnings. Rules for navigating in hurricanes and structure at 500 mb level are discussed. *Subject Headings:* **1. Hurricanes 2. Marine navigation 3. North Atlantic.**—*C.E.P.B.*

4.5–100 551.515.23(52)

Shibayama, T., **Cyclones passing by Japan proper.** *Journal of Meteorological Research, Tokyo,* 3(8):261–276, June **1951.** refs., 4 tables. In Japanese, English summary p. (19). **MH-BH**—A statistical study, covering the period 1936–1943. More cyclones are generating in the winter. The distribution of generating places and main routes for the different seasons are shown. Developing cyclones reach their maximal velocity after 135–145 hours. The moving velocity for each direction and the frequency of the directions is calculated. The seasonal variation of cyclones generating in the East China Sea is related to the "Shiome"—the borderline between the cold and warm ocean currents near the coast of East Asia. *Subject Headings:* **1. Cyclone tracks 2. Cyclone frequencies 3. Japan.**—*A.A.*

4.5–101 551.515.2

Simpson, Robert H. (*U. S. Weather Bureau, Washington, D. C.*), **Exploring eye of typhoon "Marge" 1951.** *American Meteorological Society, Bulletin,* 33(7):286–298, Sept. **1952.** 11 figs., table, 12 refs. **MH-BH**—In Aug. 1951 an unusual airplane reconnaissance of a mature typhoon succeeded in collecting extensive data from the eye and adjacent rain area of the storm. The eye, which was clear except for a low stratocumulus undercast, was circular, 40 miles in diameter, and had a central pressure at the surface of 26.43 in. (895 mb) with a sizable pressure gradient from the center to edge of the eye. Walls of nimbostratus surrounding the eye rose like a huge coliseum to a height of 35,000 ft. Two eye soundings from the surface to 17,000 ft were made, the first at midday, the second in late afternoon. These revealed exceptionally warm temperatures, more than 16°C at 17,000 feet, with lapse rates essentially isothermal from the surface to 10,000 ft. Marked cooling occurred between these two soundings in the layer 7000-10,000 ft. Horizontally, temperature varied little at 800 ft; at 9000 ft, however, the eye center was nearly 8°C warmer, and at 18,000 ft 18°C warmer than the adjacent rain area. At 9000 ft, significant temperature gradients were

confined primarily to the eye, while at 18,000 ft they were concentrated in the rain area. Photographs of convective cloudiness near the storm, views of the eye from various elevations, and of the radar view of the eye of the typhoon "Marge," a surface map of the typhoon at 0600 M.S.T. (Aug. 15, 1951), a map showing the mean vertical temperature fields and a schematic vertical cross section of the eye are included. *Subject Headings:* **1. Eye of typhoon 2. Typhoon "Marge" (1951).**—*Author's abstract.*

4.5–102 551.515.3:551.46:532.59

Uda, M. (*Tokyo, Fisheries Univ.*), **On the swell as an indicator of typhoon.** *Geophysical Magazine*, Tokyo, 23(4):453–461, May **1952.** 7 figs., table. **MH-BH**—The principal factor of swell is "long waves started from the same region of the pyramidical waves generated by the interference of the wave systems having different directions near the typhoon centre which resembles the source of *Tsunami* and intensified by the progression of typhoon" and "by the interference of the stormy wave trains from different directions near the typhoon centre the formidable pyramidical waves are generated at the points of the superposed crests of the wave centre." On the basis of simultaneous observations at several coastal stations or on the sea, it is possible to determine graphically the center of the typhoon and its manner of movement and the computed value of pressure at the center using an empirically established equation in which intensity of the swell is a linear function of pressure, distance from typhoon center, angle included between the path line of the typhoon center from the station and the speed of the typhoon. *Subject Headings:* **1. Swell 2. Typhoon forecasting 3. Typhoon tracking.**—*I.L.D.*

4.5–103 551.515.23:551.515.22

Ando, T., **On the relation between intensity and velocity of typhoon.** *Journal of Meteorological Research*, Tokyo, 4(1):10–14, March **1952.** 4 figs., 3 tables, 3 refs., 12 eqs. In Japanese, English summary p. (1). **MH-BH**—Data on the correlation between central pressure of a typhoon and its northward velocity, between mean radius and mean velocity and between intensity and distance of latitudinal displacement are presented and discussed. It is found that "northward movement of strong typhoons is generally faster than that of weak typhoons," which is attributed to the effect of the Rossby force. *Subject Headings:* **1. Typhoon velocities 2. Typhoon mechanics.**—*G.T.*

4.5–104 551.515.23(52):551.557.2

Nakamura, N., **Trajectory of air particles and the movement of typhoon.** *Journal of Meteorological Research*, Tokyo, 4(1):25–27, March **1952.** 4 figs. In Japanese, English summary p. (1). **MH-BH**—Air trajectories in the neighborhood of typhoons are investigated. Charts presented show air trajectories at various levels in connection with various positions of typhoons "Kitty," "Jane" and "Kezia" (Aug. and Sept. 1949 and 1950). Air trajectories are found to follow closely the path of typhoons. *Subject Headings:* **1. Air trajectories 2. Typhoon tracks 3. Japan.**—*G.T.*

4.5–105 551.515.23:551.509.59

Takahashi, Kamekiti, **Statistics of typhoon velocity.** *Journal of Meteorological Research*, Tokyo, 4(1):1–9, March **1952.** 2 figs., 23 eqs. In Japanese, English summary p. (1). **MH-BH**—Data on the frequency distribution of velocities of typhoons at various latitudes and for various typhoon directions, and on frequency distribution of the direction of typhoons are presented. From a kinematic analysis of the statistical material, the author derives expressions for predicting position of the eye of a typhoon. He also calculates and graphically represents the probable error implied in such prediction. *Subject Headings:* **1. Typhoon velocities 2. Kinematic analysis 3. Typhoon forecasting.**—*G.T.*

4.5–106 551.515.23:551.524.2

Takahashi, Kamekiti; Iida, M. and Kubota, S., **Temperature field and path of typhoon.** *Journal of Meteorological Research*, Tokyo, 4(1):20–24, March **1952.** 6 figs., 2 tables. In Japanese, English summary p. (1). **MH-BH**—Temperature field on the earth's surface is

good indication of the path of typhoons. The relation between temperature gradient and velocity of typhoons is investigated. Thickness charts between 500 mb and 1000 mb were prepared and relations between their pattern and the path of typhoons established. *Subject Heading:* **1. Typhoon dynamics.**—*Author's abstract.*

4.5–107 551.515.23:551.557

Takahashi, Kamekiti and Okuta, M., **Upper air current and velocity of typhoon.** *Journal of Meteorological Research*, Tokyo, 4(1):15–19, March **1952.** 5 figs., 2 refs. In Japanese, English summary p. (1). **MH-BH**—Steering level of typhoons is estimated to be the 500 mb level. This conclusion is reached by comparing actual typhoon movement with upper air current in Japan. Five-day mean chart of 700 mb level is shown to be useful for forecasting typhoon movements. *Subject Headings:* **1. Typhoon movement 2. Upper air winds 3. Japan.** —*Author's abstract.*

4.5–108 551.515.71

Roulleau, Jean, **Sur le rôle de la vapeur d'eau dans l'alimentation des anticyclones.** [The role of water vapor in the alimentation of anticyclones.] *Académie des Sciences, Paris, Comptes Rendus*, 235(13):664–665, Sept. 29, **1952.** 2 refs., eq. **DWB**—The fact that anticyclones often do not lose any of their energy during prolonged periods, despite friction at the earth's surface, is explained by a gain in energy due to evaporation of water introduced into the air mass, especially in the case of ocean anticyclones. A comparison of THORNTHWAITE's and HOLZMANN's formula on the rate of evaporation and of TAYLOR's expression applied to energy losses by turbulence appears to support the hypothesis. Further evidence to the same effect was found in actual measurement. *Subject Headings:* **1. Anticyclogenesis 2. Evaporation of water drops.**—*G.T.*

RADIATION AND TEMPERATURE

RADIATION

See also: 4.5–38, **German meteorological yearbook;** 4.5–47, **Infrared spectrograph for 40–150μ spectral region** (Oejtjen and others); 4.5–60, **Electrometric investigations of atmospheric transparency in UV region of spectrum** (Bezverkhniĭ); 4.5–87, **Ionospheric absorption by N_2 and O_2 of certain extreme UV solar wave lengths** (Clark); 4.5–190, **Solar climate of Stellenbosch** (de Villiers); 4.5–220, **Progress in meteorological optics** (Fujiwara); 4.5–222, **Mie's theory of refraction, its importance for problems of interstellar matter and atmospheric aerosols** (Güttler); 4.5–223, **Light and color in open air;** 4.5–234, **Intensities of UV of auroral spectrum.**

4.5–109 551.521:06 551.590.21:06

†Commission Pour l'Étude des Relations entre les Phénomènes Solaires et Terrestres, **Septième rapport.** [7th report.] Paris, Aemmerle, Petit, **1951.** 206 p. illus., bibliog. **DWB**—Includes 12 reports by various authors (abstracted separately) on solar phenomena, cosmic, electromagnetic and night sky radiation, solar constant, ionosphere, geomagnetism and relations to terrestrial weather. Each report summarizes recent literature and contains extensive bibliographies. *Subject Headings:* **1. Solar influences 2. Solar phenomena. I. International Council for Scientific Unions.**—*C.E.P.B.*

4.5–110 551.521.1

*†Hand, I. F. and Wollaston, Frances A. (*U. S. Weather Bur., Boston*), **Measurements of diffuse solar radiation at Blue Hill Observatory.** *U. S. Weather Bureau, Technical Paper*, No. 18, May **1952.** 19 p. 3 figs., 2 tables. 16 refs., bibliog. **DWB**—Records of diffuse radiation have been obtained at Blue Hill Observatory continuously since October 28, 1945, by means of a pyrheliometer equipped with an occulting ring which shades the receiving surface from the sun but permits practically all of the diffuse radiation to impinge upon the instrument. The results of the first four years of record are summarized in tabular and graphical form. The difficulties of obtaining precise measurements and the limitations of the instrumental equipment are described. A selected bibliography on diffuse radiation is included [for 1882–1950].

Subject Headings: **1. Diffuse radiation 2. Pyrheliometers 3. Blue Hill Observatory, Mass.** —*Authors' abstract.*

4.5–111 551.521.14:551.578.46

Miller, David H., **Albedo of the snow surface with reference to its age.** U. S. Corps of Engineers, Project CW-171, Technical Bulletin No. 6, April 21, **1950.** 8 p. table, graphs, refs. **DWB**—Two graphs (one for the accumulation season and one for the melt season) showing albedo as a function of the age of snow surface are presented. They are based on albedo measurements made at the Central Sierra Snow Lab. (1945–1948) and the Upper Columbia Snow Lab. (spring season 1947–48). Albedo values are grouped into six age classes from fresh snow up to snow 8 days old and more. The effects of rain, of surface debris (pine needles, solid smoke particles), of sun angle and of radiation absorption by underlying rock, are considered. *Subject Headings:* **1. Albedo of snow. I. Project CW-171 II. U. S. Corps of Engineers.**—*G.T.*

4.5–112 551.521.2:551.515.8

Utah. University. Meteorology Dept., **Atmospheric Radiation Research Project.** Contract AF 19(122)-256, Quarterly Progress Report, No. 5, June 15–Sept. 15, **1951.** 129 p. 29 tables, 45 figs., bibliog. Append. A: **A study of the long wave radiation balance in certain typical air masses,** by Thomas E. Hoffer (p. 22–23). Append. B: **The distribution of water vapor radiative-cooling in an outbreak of polar air,** by John E. Alder (p. 20–21). **DWB**—The investigation of rates of radiative-cooling in tropospheric air masses reported by Mr. Hoffer in Report No. 3 has been extended by him to include an investigation of the rates of cooling within typical clouds which have been observed in the same air masses. Mr. Hoffer's consolidated report is included here as Appendix A. The investigation of rates of radiative-cooling over the North American region during the period of 3 April to 8 April 1950 has been partially completed. In Appendix B of this report, Mr. Alder reports on the distribution of radiative-cooling during the period 0300 to 1500 GCT, 5 April 1950 within the continental polar air mass which dominated most of the United States during that period. *Subject Headings:* **1. Radiational cooling 2. Air masses 3. Troposphere. I. Contract AF 19(122)-256 II. Hoffer, Thomas E. III. Alder, John E.**—*Author's abstract.*

4.5–113 551.521.32:551.525

Kawabata, Y., Oomori, F. and Hattori, T. (*Kyushu Met. Obs.*), **Radiative properties of several kinds of soil.** *Journal of Agricultural Meteorology*, Tokyo, 6(3/4):170–172, Aug. **1951.** 2 figs., 3 tables. In Japanese, English summary p. 172. **MH-BH**—Radiative properties of the ground have been investigated in experiments made with three samples of soil, viz., sandy soil, ordinary loam and humus loam. Thermal emissivities for the three kinds of soil are 95, 97 and 99%, respectively, as compared to values of a black body radiator. These values are not seriously changed even if the condition of the soil is wet. The measured values of absorptivity are 87, 95 and 99%, the absorptivities for solar radiation 89, 97 and 99%. Thus, it can be stated that the earth's surface is almost equivalent to the grey radiator in respect to emissivity and absorptivity. *Subject Headings:* **1. Terrestrial radiation 2. Thermal emissivity of soil 3. Japan.**—*From authors' abstract.*

4.5–114 551.521.3

Godson, Warren L. (*Met. Div., Toronto*), **The determination of radiative fluxes due to atmospheric water vapor.** *Royal Meteorological Society, Canadian Branch [Publications]*, 3(5):1–15, May 29, **1952.** 4 tables, 5 refs., 22 eqs. **DWB**—The formal problem of radiative flux determination is developed, and it is indicated why the integration over all wave lengths should precede the introduction of actual atmospheric data into flux computation. A technique to do this is outlined. The properties of suitable intensity transmission functions are described. A procedure for obtaining the transmission of black body radiation by a number of layers of varying pressure and temperature is presented and applied to the basic problem of determination of total radiative fluxes. The relation of this technique to those advocated by

ELSASSER (1942), ROBINSON (1947), and KAPLAN (1952) is presented, together with brief derivations of the relations utilized by these authors. *Subject Headings:* **1. Radiation flux 2. Radiation calculations.**—*From author's abstract.*

4.5–115 551.521.64:523.51

Singer, S. F., **Meteorites and cosmic rays.** *Nature*, London, 170(4331):728–729, Nov. 1, 1952. Note by F. A. Paneth p. 729. 16 refs. **DWB**—A discussion of the production of helium in meteorites by cosmic radiation, and its bearing on the determination of the age of meteorites. *Subject Headings:* **1. Cosmic radiation 2. Meteorites. I. Paneth, F. A.**—*C.E.P.B.*

4.5–116 551.521.7

†Allen, C. W., **Observations of solar radio-noise.** *Commission pour l'Étude des Relations entre les Phénomènes Solaires et Terrestres, 7e Rapport*, p. 63–75. 1951. fig., 3 tables, 54 refs. **DWB**—Recent observations on 18–35,000 Mc/s are summarized. Quiet thermal noise, increasing with frequency, represents an apparent temperature (Ta) of 6400°K at 0.6 cm. Steady sunspot noise increases with sunspot area and gives a maximum at 600 Mc/s, Ta = 90 $\times 10^6$K. On meter wave lengths there are noise storms, and "bursts" with a line spectrum. *Subject Heading:* **1. Solar radio noises.**—*C.E.P.B.*

4.5–117 551.521.7:621.396:523.78

Denisse, J. F., Blum, E. J. and Steinberg, J. L., **Radio observations of the solar eclipses of September 1, 1951, and February 25, 1952.** *Nature*, London 170(4318):191–192, Aug. 2, 1952. 2 figs., 3 refs. **DWB**—Summary and discussion of observations on 3.2 and 1.78 m waves at Markala Dam (13°42'N, 6°4'W) on Sept. 1, 1951, and in Paris and Dakar on Feb. 25, 1952. *Subject Headings:* **1. Radio frequency radiation 2. Solar eclipses.**—*C.E.P.B.*

4.5–118 551.521.7:523.78(624)

Laffineur, Marius, Michard, Raymond and Pecker, Jean-Claude, **Observations combinées de l'éclipse totale de soleil du 25 février 1952 à Khartoum (Soudan) et de l'éclipse partielle au radiotélescope de l'Observatoire de Meudon.** [Combined observations of the total solar eclipse of Feb. 25 at Khartoum (Sudan) and of the partial eclipse with the radio-telescope of the Meudon Observatory.] *Académie des Sciences, Paris, Comptes Rendus*, 234(15):1528–1530, April 7, 1952. **DLC**—The apparatus for making radiomagnetic observations consisted of a parabolic reflector 6 m in diameter with a focal length of 3.6 m equatorially mounted with two half wave antennae and reflective antennae in the focus. The radiation intensity of the part of the corona not covered by the moon was for 550 Mc/s equal to 19.5±1% of the total noneclipsed solar radiation and for 255 Mc/s equal to 30.5±1%. At Meudon the partial radioelectric eclipse was 13 minutes later than the optical eclipse. The method of obtaining optical observations is described. *Subject Headings:* **1. Solar eclipses 2. Solar radioelectric measurements 3. Khartoum, Sudan 4. Meudon Observatory, France. I. d'Azambuja, Marguerite II. Dollfus, Audoin III. Atanasijević, Ivan.**—*I.L.D.*

TEMPERATURE

See also: 4.5–68, **Quantitative daily min. temp. forecasting, Lydda Airport, Israel** (Klein, Yifrach); 4.5–85, **Formation of ionospheric layers with various temp. distribution in atmosphere** (Burkard); 4.5–106, **Temp. field and path of typhoon** (Takahashi, Iida, Kubota).

4.5–119 551.524.36(57)

Armstrong, Terence, **The cold pole of the world.** *Weather*, 7(12):368–369, Dec. 1952. fig. 9 refs. **MH-BH**—Quotes a figure of −67.7°C at Oimekon (63°16'N, 143°15'E, 800 m) as the lowest correct minimum temperature. Mean and extreme monthly temperatures 1930–33 at Oimekon and Verkhoiansk compared graphically. *Subject Headings:* **1. Temperature extremes 2. Siberia, U.S.S.R.**—*C.E.P.B.*

4.5–120 551.524.36:551.583.13:517.512.2(52)

Fukuda, K., **On the periodicity of abnormal temperatures at Miyako.** *Journal of Meteorological Research*, 3(9):324, July **1951.** fig., table. In Japanese. **DWB**—Brief note accompanying data showing application of periodogram analysis to Miyako temperature for Oct. 1883–1950 for 26 month period. *Subject Headings:* **1. Temperature extremes 2. Periodicities 3. Periodogram analysis 4. Miyako, Japan.**—*M.R.*

4.5–121 551.524.36:551.513.2(73/9)

Klein, William H. *(U. S. Weather Bur.)*, **The weather and circulation of June 1952; a month with a record heat wave.** *Monthly Weather Review*, 80(6):99–104, June **1952.** 9 figs., 5 refs. **DWB**—The distribution of temperature anomalies and the mean 700 mb circulation for June 1952 (dominated by one of the most extensive and prolonged heat waves in recent years) and June 1951 over the U. S. are compared by means of charts. The June 1952 circulation pattern is found to be similar to that observed during summer heat waves from 1947 through 1951, which is represented in a composite chart. Besides the heat wave, other aspects of the June 1952 weather and circulation, such as below-normal temperature in western states, precipitation anomalies, etc. are discussed and illustrated. *Subject Headings:* **1. Heat waves 2. Synoptic studies 3. United States.**—*G.T.*

4.5–122 551.524.36

Höhndorf, Fritz, **Anomalien im nächtlichen Temperaturgang auf dem Hohenpeissenberg.** [Anomalies in the nocturnal course of temperature on the Hohenpeissenberg.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 35:299–301, **1952.** 8 figs. **MHBH**—A number of thermograms are reproduced and their peculiarities related to the associated weather. *Subject Heading:* **1. Nocturnal cooling.**—*C.E.P.B.*

4.5–123 551.524.37 551.509.532

Iowa. State College of Agriculture and Mechanic Arts, **Final report on the statistical analysis of freeze data.** Contract Cwb 6028, Final report on freeze and normal studies, June **1948.** 20 p. 5 figs., 7 tables, 8 refs. **Final report on a study of normals in climatology.** *Ibid.*, 14 figs., 23 eqs. Corton, Edward L., Jr., **The influence of location on the length of the freeze-free season in Iowa.** *Ibid.*, Thesis (*M.S.*) 63 p. 20 figs., 6 tables, 31 refs. **DWB**—In the final report on statistical analysis of freeze date, statistical methods are applied to freeze series, that is the sequence of dates of annual occurrence of spring or fall freeze. The randomness and normal distribution of freeze dates are tested by means of autocorrelation coefficients and by Georg and Pearson's test for skewness and kurtosis. The probability of freeze hazard is determined by plotting on normal probability coordinate paper the mean at 50% and $\bar{x}\pm 2S$ at 2.275% and 97.725%, respectively. An analysis of the homogeneity of freeze date variance indicates that for 99% acceptance region the variances over Iowa are homogeneous and that variations are the result of sampling. The freeze-free period distribution junction is

$$F_{(x)} = \int_{-\infty}^{t} \frac{1}{2\pi(S_S^2 + S_F^2)^{\frac{1}{2}}} e^{\frac{-[x-(\bar{x}_F-\bar{x}_S)]^2}{2(S_S^2+S_F^2)}} dx.$$

In the final report on freeze and normal studies, a distinction is established between the normal as a population parameter and as an estimation of the population parameter or the arithmetic mean. The computation of the arithmetic mean or normal and criteria for the goodness of estimate of this normal, the standard error of the normal, the interpretation of the standard error of the normal and univariate and multivariate propagation of variance are discussed. In the article by E. L. Corton it is shown that the freeze-free season in Iowa is influenced by altitude, latitude and longitude. Using these factors as independent variables, multiple regression equations are derived for predicting the mean date of the first fall freeze, the last spring freeze and the length of the freeze-free season. (*Same item as* 4C–280, March 1953, *MAB.*) *Subject Headings:* **1. Freeze data analysis 2. Agricultural climatology 3. Frost forecasting 4. Statistical analysis 5. Iowa. I. Corton, Edward L., Jr. II. Contract Cwb 6028.**—*I.L.D.*

4.5–124 551.524.7:551.589.1

Faust, Heinrich, **Monatsmittel der Lufttemperatur am Boden und in den 850-, 700- und 500-mb-Höhen bei gradliniger Nord- und Südströmung.** [Monthly mean temperature at the surface and 850, 700 and 500 mb levels in rectilinear north and south currents.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 42:230–233. 1952. 18 figs., 8 refs. DWB—Mean temperature over Europe and N. Atlantic were calculated for occasions (1942–51, Jan., July) at 0, 850, 700 and 500 mb on days when wind blew for at least 20° of lat. straight from N (NW–NE) or S (SW–SE); results shown on charts. Annual variations are shown for Moscow and weather ship 52.8 N, 35.5 W. *Subject Headings:* **1. Upper air temperatures 2. Synoptic climatology 3. Europe 4. North Atlantic.**—*C.E.P.B.*

SOIL TEMPERATURES

See also: 4.5–38, **German meteorological yearbook; 4.5–113, Radiative properties of several kinds of soil** (Kawabata, Oomori, Hattori).

4.5–125 551.525

Monin, A. S., **Metod rascheta temperatury v pochve.** [Methods of calculating soil temperatures.] *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhy. Informatsionnyĭ Sbornik*, 1:125–131, 1951. ref., 31 eqs. **DLC**—A mathematical analysis of a method for determining the soil temperature from observations in a thermometer shelter. The author makes use of the heat conductivity equation for the two mediums (air-soil) when air temperature in the screen is a certain function of time. In the solution of the differential equation, the author neglects the changes of air temperature at a great height and the changes of soil temperature at a great depth, assuming them as being constant. *Subject Heading:* **1. Soil temperatures.**—*N.T.Z.*

4.5–126 551.525.2:633.491

Nishiuchi, H. and Miyagawa, I., **Influence of the different soil temperature-systems on the growth of the sweet potatoes.** *Journal of Agricultural Meteorology*, Tokyo, 6(3/4):157–159, Aug. 1951. 2 figs., 2 tables, 3 refs. In Japanese, English summary p. 159. **MH-BH**—The growth of sweet potatoes was investigated in field plots with different soil temperature distribution controlled by thermoelectric wires installed at varying depths in the soil. The plots warmed by the thermoelectric wires were worse for the growth of the tuberous root than the standard (not warmed), though they were better for the growth of the stems and leaves above the ground. The plot warmed at 10 cm depth, which is ordinarily the center of tuberous roots of sweet potatoes, produced particularly poor tuberous root. Thus it was proved that the distribution of soil temperature has much influence on the tuberization of the root of sweet potatoes and high temperature of the subsoil layer is unfavorable for the growth of the tuberous root. *Subject Headings:* **1. Soil temperatures 2. Sweet potatoes.**—*From authors' abstract.*

4.5–127 551.525.4

Itoo, S. and Kusakabe, M. (*Central Met. Obs. Tokyo*), **The diurnal change of temperature of air dried and water saturated soil.** *Journal of Agricultural Meteorology*, Tokyo, 6(3/4):176–178, Aug. 1951. 3 figs., 2 tables, 2 refs. In Japanese, English summary p. 178. **MH-BH**—The authors observed the diurnal change in soil temperature: A) air dried soil, B) water saturated soil, C) the soil where water content changes naturally and D) natural soil. Results of the observation are shown in graphs. Temperature differences between cases A and B at the surface and at depths of 5, 10 and 20 cm are graphically compared. The following empirical formulas exist between the depth (x cm) and the diurnal temperature difference of this depth (R_x °C). A) $R_x = 33.5e^{-0.145x}$ B) $R_x = 16.6e^{-0.142x}$ C) $R_x = 22.6e^{-0.121x}$ D) $R_x = 30.3e^{-0.145x}$. The authors calculated the depth at which the diurnal change is not noticeable ($R_x = 0.1$); A) 39.4 cm, B) 36.1 cm, C) 43.7 cm and D) 40.2 cm. *Subject Headings:* **1. Diurnal soil temperature variations 2. Japan.**—*From authors' abstract.*

4.5–128 551.525.4:551.508.29

Platt, Robert B. (*Emory Univ., Atlanta, Ga.*) and Wolf, James N. (*Mich. Univ., Ann Arbor, Mich.*), **A method for controlling natural soil temperature gradients.** *Ecology*, 33(2):278–282,

April 1952. 2 figs. **MH-BH**—Description of apparatus constructed by the authors for the production of controlled soil temperature gradients. Six reflector type infrared lamps used as sources of heat may be moved vertically or horizontally. A Western Electric disc type thermistor is used as the temperature sensing element. A thermal control unit has a sensitivity of 1°C. The numerous experimental observations made since 1947 of different temperatures and moisture conditions for various soils show good results and ease of work with this instrument. *Subject Headings:* **1. Soil temperature gradient 2. Observation techniques 3. Soil temperature instruments.**—*N.T.Z.*

ATMOSPHERIC PRESSURE AND WIND

PRESSURE

See also: 4.5–147, **Significance of mean contour charts** (Crossby).

4.5–129 551.543:551.510.535

Lewis, R. P. Waldo and McIntosh, C. H., **Geophysical and meteorological changes in the period January–April 1949.** *Nature*, London, 170(4325):488–489, Sept. 20, **1952.** 4 refs., eqs. **DWB**—The inverse relation between daily pressures at Kew, England, and the vertical incidence critical frequency of normal E region claimed by W. J. G. Beynon and G. M. Brown (*Nature*, 167:1012, 1951) is tested by statistical criteria and found to be not significant. *Subject Headings:* **1. Pressure oscillations 2. E layer.**—*C.E.P.B.*

4.5–130 551.543:629.12(261)

Rodewald, Martin, **Bemerkungen zu einer Sommerreise Lübeck-St. John (New Brunswick), Route um Schottland (1.–18.6.1952).** [Remarks on a summer journey, Lübeck-St. John (N. B.), via Scotland (June 1–18, 1952).] *Wetterlotse*, 43:134–144, Sept. **1952.** 6 figs. **DWB**—A discussion of the question whether the westward sea route north of Scotland is likely to prove advantageous in summer. The mean pressure chart for May 1952 showed favoring winds and the "Hennig Oldendorff" accordingly took the northern route, passing Cape Wrath on June 6, but on that day weather changed to a westerly type. This is shown to be a regular seasonal tendency. *Subject Headings:* **1. Pressure variations 2. Marine navigation 3. North Atlantic.**—*C.E.P.B.*

4.5–131 551.543

Schumann, Theodor E. W., **Behaviour of atmospheric pressure systems.** *Nature*, London, 170(4338):1077, Dec. 20, **1952.** fig. **DWB**—For 1929–38, 380 days of maximum pressure departure at 80°W, 50°N were selected and charts of mean distribution of pressure drawn for those days and 2 following days. These showed a westward movement of the center by 413 nautical miles/day, with decreasing intensity. *Subject Heading:* **1. Pressure anomalies.**—*C.E.P.B.*

4.5–132 551.543.5:519.241.1

Schumann, Theodor E. W., **Auto-correlation of annual atmospheric pressures.** *Weather*, (12):370–371, Dec. **1952.** 2 tables, ref. **MH-BH**—Out of 255 autocorrelation coefficients with 1 year lag, 153 were significant at 5% level and 116 at 1%. With 5 years' lag, numbers were 48 and 18. This proves existence of significant correlations on which seasonal forecasts can be based. *Subject Headings:* **1. Pressure trends 2. Autocorrelations.**—*C.E.P.B.*

WIND

See also: 4.5–149, **Flow of stable atmosphere over heated island** (Malkus, Stern); **Bibliography on upper level winds,** p.

4.5–133 551.552:551.557

§Murray, R., **The jet streams over the British Isles during 14–18 June, 1951.** *Great Britain. Meteorological Research Committee, M.R.P.*, 743, August 16, **1952.** 8 p. 19 figs., refs. Mimeographed. **DWB**—A long-wave trough with associated depression north of

Scotland is shown by surface and 300 mb charts. Vertical wind and temperature sections show a cold frontal zone and two jet streams. One moved rapidly SE into Europe, dying out June 16, the other moved SE across British Isles at about 5 kt, becoming dominant June 15. Their average lateral speed (7.9 kt) compares with geostrophic component of 6.5 kt. Changes in wind maxima were related to changes of mean thermal gradient of troposphere. A model for tropopause structure and development during jet streams is put forward. *Subject Headings:* **1. Jet stream 2. British Isles.**—*C.E.P.B.*

4.5–134 551.552(42):551.556:634

Preston, A. P., **Wind records in some Kent orchards.** *Commonwealth Bureau of Horticulture and Plantation Crops, East Malling, England, Annual Report,* 39:93–96, **1951.** 3 figs., 2 tables, ref. **MH-BH**—Cup anemometers were exposed 25½ and 4½ ft above ground in 6 apple orchards (hill top and valley). Daily runs are given for 5 blossom seasons; they showed that wind data from normally exposed anemometers can be used to compute wind within orchards. *Subject Headings:* **1. Wind computation 2. Fruit culture 3. Kent, Eng.**—*C.E.P.B.*

4.5–135 551.553(434/5)

Manig, M. (*Bad Kissingen*), **Karte der Windeschwindigkeit für das westliche Deutschland.** [Map of wind velocity for west Germany.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte,* No. 34, **1952.** 5 p. 2 charts, 4 refs. **DWB**—The author reviews previous attempts at making wind velocity maps in Europe and America and the methodological problems encountered in constructing a wind velocity chart for Germany are discussed. In view of the slight interannual variation in wind velocity, the wind velocities for all available stations for the year 1945 serve as a basis for constructing a map of the mean annual wind velocity of west Germany. Data on annual means of wind velocity for selected stations in Germany and distribution of annual wind velocities in the coastal lowlands and in the Mittelgebirge are given and maps with line of equal wind velocity are attached. *Subject Headings:* **1. Wind velocity maps 2. Wind variations 3. Maps 4. Western Germany.**—*I.L.D.*

4.5–136 551.553.6(669)

*Clackson, J. R., **Gusts in Nigeria.** *Nigeria. Meteorological Services, Lagos. Meteorological Notes,* No. 1, **1952.** 13 p. 6 tables. **DWB**—Monthly tables for 6 stations in Nigeria showing frequency of gusts of 30–39, 40–49 . . . 90 mph, diurnal variation and direction. Highest gust 90 mph at Kano. *Subject Headings:* **1. Gust frequencies 2. Nigeria.** —*C.E.P.B.*

4.5–137 551.555.3

Schüepp, Walter, **Die qualitative und quantitative Bedeutung der Föhnmauer.** [The qualitative and quantitative significance of the Föhn wall.] *Meteorologische Rundschau,* 5(7/8):136–138, July/Aug. **1952.** 3 figs., 12 refs. German, English, French summaries p. 136. **DWB**—Models are constructed of stream lines, isotherms and isolines of relative humidity, up to 4000 m, for föhn in: 1) anticyclonic conditions (satisfying Frey's theory), with no föhn wall cloud; 2) cyclonic, föhn wall extending down to surface; 3) "Dimmerföhn," very well developed wall ending at a mass of old cold air trapped in lee of mountains. The föhn wall is associated with a large horizontal temperature gradient and descending air. *Subject Headings:* **1. Föhn winds 2. Föhn wall.**—*C.E.P.B.*

4.5–138 551.555.5(44)

§Galzi, L., **Contribution à l'étude du mistral.** [Contribution to the study of the mistral.] *La Météorologie,* 4th Ser., No. 25:7–23, Jan./March **1952.** 18 figs. French, English and Spanish summaries p. 7. **DWB**—Since the formation of mistral has been duly analyzed by other investigators, the author mainly dwells upon the factors which cause its dissolution. Two principal cases (mistral subsiding (1) to barometric high progressing from the east and (2) to barometric low coming from the west) are described and illustrated by synoptic charts showing the development of two winds in 1950. The correlation between mistrals and temperature is discussed and illustrated, with particular consideration of temperature contrasts characterizing Mediterranean France. Data on the diurnal variation of mistral intensities are presented for each month of the year (averages for 1947–1949). Wind curves for Toulon and for Nimes are compared and discussed. The effect of mistral on precipitation and cloudi-

ness is considered. *Subject Headings:* **1. Mistral 2. Mistral intensity variations 3. Mediterranean Region, France.**—*G.T.*

4.5–139 551.555.8(624)

*§Freeman, M. H., **Duststorms of the Anglo-Egyptian Sudan.** *Great Britain. Meteorological Office, Meteorological Reports*, No. 11, **1952.** 22 p. 13 figs., 4 tables, 6 refs. M.O. 535f. **GB-MO**—From observations at Khartoum 1944–48, duststorms are classified as: 1) extensive winter storms due to strong Nly winds; 2) haboobs (local); 3) other summer duststorms due to Sly winds behind northward passage of intertropical front. Each type is described, with synoptic charts and frequency and visibility tables, and causes are discussed. *Subject Headings:* **1. Dust storms 2. Haboobs 3. Anglo-Egyptian Sudan.**—*C.E.P.B.*

WIND EFFECTS

See also: 4.5–134, **Wind records in some Kent orchards** (Preston).

4.5–140 551.556.3:621.311.24

Ailleret, P., **La recherche des sites qui pourraient convenir à une utilisation de l'énergie du vent.** [Investigation of sites suitable for the utilization of wind energy.] *La Météorologie*, Ser. 4, No. 10:145–152, April–June **1948.** 3 figs., 5 refs. **DWB**—Graph shows amount of energy available from wind power as a function of wind speed (force) and hours per year; various speeds were obtained at the Eiffel Tower (1901–1921). The strong winds (15 m/sec or over) and feeble winds (4 m/sec) are discounted as being unavailable for practical use with an aeromotor. Data from a station on Cape Bear is also shown graphically, and methods for choosing sites and stations for studying wind power are outlined. *Subject Headings:* **1. Wind utilization 2. Wind power calculations 3. Instrument exposure 4. Wind power stations.**—*M.R.*

4.5–141 551.556.3:621.311.24

Golding, E. W. and Stodhart, A. H., **The potentialities of wind power for electricity generation (with special reference to small-scale operation).** *British Electrical and Allied Industries Research Association, Technical Report*, Reference W/T16, **1949.** 26 p. 20 figs., 4 tables, 10 refs. Price: 1/6d. **DWB**—This report includes general considerations regarding wind statistics and the selection of data significant for aerodynamical studies. The relation between wind velocity and power available is analyzed in detail and data on available aerodynamic energy are presented for various British localities. The effects of contour, altitude and of changing wind direction or speed are considered. *Subject Headings:* **1. Wind utilization 2. Wind generators 3. Wind power stations 4. Great Britain.**—*G.T.*

4.5–142 551.556.3:621.311.24

Golding, E. W. and Stodhart, A. H., **The selection and characteristics of wind-power sites.** *The Electrical Research Association, Leatherhead, Surrey, England, Technical Report*, C/T108, **1952.** 32 p. 20 figs., 8 tables, 6 refs. Price: 7/–. **DWB**—The report deals with the development, throughout its various stages, of a wind survey covering areas of the British Isles (Northern Ireland and exposed headlands of Western Scotland, England and Wales) most likely to contain sites suitable for large-scale generation of electricity by wind-power. The methods by which these sites have been selected and the survey carried out, are described in some detail and sites and equipment illustrated by photos and charts. The results of the measurements are analyzed statistically and a comparison of wind flow at the sites is made. Estimates of the wind energy available and of the proportion of this which may be usable by an aerogenerator are given. Certain effects which may lead to discrepancies between estimated and actual outputs are considered. A relationship, applicable to the British Isles, is obtained between annual mean wind speed and specific output. *Subject Headings:* **1. Wind utilization 2. Wind power stations 3. British Isles.**—*Partly authors' abstract.*

4.5–143 551.556.3:621.311.24

Golding, E. W., **Large-scale generation of electricity by wind power—Preliminary report.** *British Electrical and Allied Industries Research Association, Technical Report*, Reference

C/T101, 1949. 15 p. 8 figs., 16 refs. Price: 1/6d. **DWB**—The basic principle guiding the research reported in this paper is to choose a site which not only lies in an area with high average wind speed and duration, but also shows higher values of these factors than the surrounding area. In preliminary surveys made in the Orkneys, North and South Wales, and Cornwall both requirements were met. This report describes the selection of sites based on average wind data, on orographic considerations and on detailed local wind measurements. Aerodynamic aspects of power generation are discussed and experiences collected in various countries summed up. *Subject Headings:* **1. Wind utilization 2. Wind power stations 3. Wales 4. England.**—*G.T.*

4.5–144 551.556.3:551.578.46:69(52)

Japanese building standard. Structural calculations for building. *JES Build.*, 3001, [1952?] 25 tables. Mimeographed. **DWB**—In chap. 2, Sec. 4–6 of this guide for calculation of loads and allowable stress intensities, general rules for the calculation of snow and wind loads and earthquake force are given. A snow unit weight of more than 2 kg/m² in normal regions and more than 3 kg/m² in snow regions is suggested and an index accounting for roof slope given. Simple formulas for computing wind pressure, a graph representing velocity pressure as a function of height above ground and a map illustrating regional standard values of velocity pressure due to typhoon and to whirlwind are presented. Schematic drawings show structures of various form and their vulnerability to wind. The seismic coefficient for various structures is indicated. *Subject Headings:* **1. Building design 2. Wind effects 3. Snow cover effects 4. Earthquake effects 5. Japan.**—*G.T.*

4.5–145 551.556.3:69

Kamei, Isamu (*B'ld'g. Res. Inst. Tokyo*), **Wind pressure coefficient for structure in natural wind, in the case of cylindrical and hexagonal towers.** [1952.] 4 p.+6 p. 7 figs. Mimeographed. **DWB**—Graphs show variations of wind pressure and drag coefficient for cylindrical and hexagonal structures in natural and wind tunnel conditions. It is shown that wind tunnel measurements differ from natural in the uniformity of flow of the former and the gustiness and change in wind with height of the latter. Methods of measuring pressure (devised by author) and instantaneous wind (hot wire anemometer) are described and illustrated. *Subject Headings:* **1. Wind load on structures 2. Drag coefficients 3. Wind tunnel experiments 4. Hot wire anemometers.**—*M.R.*

4.5–146 551.556.3 551.506:551.55

*Venkiteshwaran, S. P. (*Met. Office, Poona*), **Measurement of wind for a wind power survey in India.** *Journal of Scientific and Industrial Research*, New Delhi, 11A(10):442–451, Oct. 1952. 12 figs., table, 10 refs. **DWB**—Instruments and methods used in measuring wind at Indian weather stations are described and illustrated. Various characteristics of wind are discussed in respect to their effect on wind power utilization. The general equation $P=0.0000071\ BV^3$ is given for the relation between wind speed (V) in mph, swept area of wind wheel (B) in sq ft, and power available (P) in Hp. The author also deals with wind data available for India, presenting a chart of observatories conducting hourly wind measurements, and a table giving frequency values of wind speeds above 10 mph for 31 stations. *Subject Headings:* **1. Wind measurement 2. Wind instruments 3. Wind utilization 4. Wind power calculations 5. India.**—*G.T.*

UPPER AIR WINDS AND VERTICAL MOTION

See also: 4.5–75, **Wind distribution in space and precip.** (Kashin); 4.5–76, **Quantitative method of rainfall pattern prediction** (Riehl); 4.5–94, **Jet stream** (Namias); 4.5–95, **N. and S. Hemisphere jet streams** (Riehl); 4.5–104, **Trajectory of air particles and movement of typhoon** (Nakamura); 4.5–107, **Upper air current and velocity of typhoon** (Takahashi, Okuta); 4.5–133, **Jet streams over British Isles, June 14–18, 1951** (Murray); **Bibliography on upper level winds,** p.

4.5–147 551.557:551.547.1

Crossley, A. F., **Significance of mean contour charts.** *Meteorological Magazine*, London, 81(962):229–231, Aug. 1952. 2 refs., 5 eqs. **DWB**—An expression is derived for the

ageostrophic departure of the true mean wind from the mean geostrophic wind in the free air. Over Britain and Aleutian Islands the departure is about 10% of geostrophic wind. *Subject Headings:* **1. Upper air winds 2. Baric topography.**—*C.E.P.B.*

4.5–148 551.558:797.5

Ivans, William S., **8 miles high—without an engine.** *Flying*, New York, 48(2):20–21, 52–53, Aug. **1951.** figs. **DLC**—Account of a record soaring flight near Bishop, Calif., in which an altitude gain of 30,100 ft and an altitude above sea level of 42,100 ft was reached in a Schweizer 1–23 sailplane carried by the Sierra Nevada wave. The detailed narration contains several indications of meteorological conditions existing during the flight. Photos of the author and his airplane are shown. *Subject Headings:* **1. Sailplanes 2. Gliding 3. Standing waves 4. Sierra wave 5. Vertical currents.**—*G.T.*

4.5–149 551.558:551.553.11

Malkus, Joanne Starr and Stern, Melvin E., **The flow of a stable atmosphere over a heated island.** Illinois Institute of Technology, Dept. of Physics, Contract Nonr-174(00), Research Report, June **1951.** 57 p. 7 figs., 8 refs., 69 eqs. **DWB**—To study the effect of diurnal heating of a flat sandy island, such as Nantucket Island, on stable air flowing over the island, two theoretical models are presented and the differential equations are solved, (a) for an atmosphere with infinite vertical extent and (b) for a model with a lid of 2600 m height. A two-dimensional picture is drawn, assuming an impulse from a steady heat source with finite width and amplitude decaying in height. The conditions under which lee waves form and the relation of the lee waves to the sea breeze are considered. Comparison of model with observed convective cloud formations near Woods Hole is made. *Subject Headings:* **1. Sea breeze circulation 2. Convective clouds 3. Lee waves 4. Air flow over islands 5. Nantucket Island, Mass. I. Illinois. Institute of Technology. Dept. of Physics II. Contract Nonr-174(00).**—*M.R.*

4.5–150 551.558:797.5

Rossman, Fritz, **Physikalische Probleme des wiederbeginnenden deutschen Segelfluges.** [Physical problems of the renewal of gliding in Germany.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 35:138–143, **1952.** 3 figs., 2 refs. **MH-BH**—After a brief summary of relations between gliding and meteorology, thermodynamics and up-down-currents and cumulus clouds are described with examples. *Subject Headings:* **1. Gliding 2. Vertical currents.**—*C.E.P.B.*

AQUEOUS VAPOR AND HYDROMETERS

HUMIDITY AND EVAPORATION

See also: **4.5–242, Ultrasonic absorption of normal air at 456 Kc/s for different humidities.**

4.5–151 551.571:62

Bleasdale, A., **An example in applied climatology.** *Meteorological Magazine*, London, 81(965):345–347, Nov. **1952.** 4 refs. **MH-BH**—Industry requires humidity mainly as wet bulb temperature. The example quoted is the use and design of cooling towers. The need for statistics of wet bulb temperature is emphasized. *Subject Headings:* **1. Humidity effects 2. Cooling towers.**—*C.E.P.B.*

4.5–152 551.571:551.501.45

*Röhl, Eduardo, **Sobre un nuevo valor de la constante de Hann para calcular en neusties latitudes la tensión del vapor de agua en función de la presión atmospherica.** [A new value of Hann's constant useful in our latitudes for calculating vapor pressure as a function of atmospheric pressure.] *Academia de Ciencias Físicas, Matemáticas y Naturales, Caracas, Boletín*, 12(39):3–27, Oct./Dec. **1949.** tables, refs. **DLC**—By using actual mean vapor pressure at a number of stations in Venezuela at various altitudes, a constant is determined which the author claims is more suitable to calculations in the tropics than are the previously

determined constants. The formula used is $x = h/\log\frac{eo}{eh}$ and the value used in these tables for x is 6273 rather than 6865 as was used previously. Basis for these calculations is given in extenso. *Subject Headings:* **1. Vapor pressure 2. Computation tables 3. Venezuela.**—*M.R*

4.5–153 551.573:551.509.59

Ferguson, J. (*Res. Dept., Imperial Chemical Industries, Ltd., Northwich, Eng.*). **The rate of natural evaporation from shallow ponds.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 5(2):315–330, June **1952.** 4 figs., 3 tables, 15 refs., 18 eqs. **MH-BH**—The meteorological factors determining the rate of natural evaporation from "free" water surfaces are: the radiant energy supply from the sun and atmosphere, the air temperature in contact with the surface, the absolute humidity of the air, and the wind velocity and turbulence over the surface. The relevant relationship of these factors has been expressed in a differential equation, whose solution, given proper numerical instantaneous values of the determining factors and their variation with time, yields the value of the depths. Using different values of the parameters, a number of solutions of the equation were obtained by means of a differential analyser. It is shown that, provided the depth of the water is greater than about 16 cm, a simpler equation using mean values of the radiant energy flux and the air temperature over short periods of time yields almost identical results. The use of this equation for the prediction of evaporation from shallow ponds exposed to known climatic conditions is discussed. *Subject Headings:* **1. Evaporation rate 2. Evaporation forecasting 3. Temperature effects 4. Radiation effects 5. Wind effects.**—*Author's abstract.*

4.5–154 551.573(267)

Neumann, J., **Evaporation from the Red Sea.** *Israel Exploration Journal*, Jerusalem, 2(3):153–162, **1952.** table, refs., 6 eqs. Abstracted from reprint.—From observations on Daedalus Reef (25°N, 35°E) energy balance of sea surface was calculated, giving an annual evaporation of 211 cm. A check calculation from vapor pressure gradient gave 215 cm. Daily amounts vary from 0.4 cm (Feb.) to 0.8 (Aug.), with a secondary minimum in June. Estimated evaporation 29°N, 200 cm; 20°N, 225 cm; 15°N, 235 cm., average for whole Red Sea 210 cm. *Subject Headings:* **1. Evaporation 2. Red Sea.**—*C.E.P.B.*

CLOUD PHYSICS AND FOG

See also: 4.5–8, **Physics of ice and mixed clouds** (Ludlam); 4.5–11, **Thermodynamics of clouds** (Möller); 4.5–39, **Yearbook of meteorological observations, Czechoslovakia** (Lomnicky); 4.5–232, **Charge of drops in thunderclouds** (Shishkin).

4.5–155 551.574.1:551.576(02)

Coulomb, J. (*Dir. Institut der Mét. et de Physique du Globe de l'Algérie*) and Loisel, J., **La physique des nuages.** [Cloud physics.] Paris, Albin Michel, [**1940**]. 282 p. 161 figs. **DLC**—One of the first and most comprehensive works on cloud physics. Beginning with history of cloud classification, the current international classification, cloud types, subspecies and varieties, the text goes on to discuss theory of condensation and sublimation, change of state, heat of condensation, effects of convection, turbulence, mixing, radiation and waves, lenticular clouds, orographic clouds; instability clouds, air mass and frontal (warm and cold) clouds; condensation nuclei, ions, hygroscopic nuclei, haze, coalescence of drops, freezing, ice forms, virga; optical phenomena (halos, coronas, etc), nocturnal clouds, nacreous clouds, lightning and electricity of convection clouds. Profusely illustrated and well-indexed. Each individual cloud type is discussed in a separate chapter. (*Same item as* No. C–35, March 1950, *MAB*). *Subject Headings:* **1. Cloud physics 2. Atmospheric turbulence 3. Cloud classification 4. Noctilucent clouds 5. Textbooks.**—*M.R.*

4.5–156 551.574.1:551.576.1

Ogiwara, S. and Ookita, T. (*Tohoku Univ., Sendai*), **Electron-microscopic study of cloud and fog nuclei.** *Meteorological Society of Japan, Journal*, 39(4):132–140, April **1952.** 2 figs., 2 tables, 6 refs. In Japanese, English summary p. 132. **MH-BH**—Photomicrographs of hygroscopic nuclei captured in clouds and fog and subjected to various treatments are presented and found to be similar to hygroscopic particles obtained in haze and to combustion particles artificially produced (which are also shown in photographs). The absence of sea-salt nuclei in the material examined appears to minimize the importance of sea spray as nucleating substance. The authors believe that "cloud and fog nuclei are composed of combustion products, which are the mixture of hygroscopic and nonhygroscopic substances." The apparatus used for the cloud-chamber investigation is described and illustrated. *Subject Headings:* **1. Hygroscopic nuclei 2. Nucleation 3. Condensation nuclei.**—*G.T.*

4.5–157 551.574.1:551.584.41:551.576.11

Rossmann, Fritz (*Munich*), **Das Rauchen der Wälder nach Regen und die Unterscheidung von Wasserdampf und Wasserrauch.** [The steaming of forests after rainfall and the distinction between water vapor and water steam.] *Wetter und Leben*, 4(3/4):56–57, April **1952. MH-BH**—The steaming of forests, marked by the appearance of clouds above the tree tops, is a phenomenon observed immediately after rainfall when the crown of the forest is thoroughly soaked. The warm, almost saturated air ascending from the crown region mixes with cooler, but less saturated air immediately above it so that the dew point is reached, condensation occurs and clouds are formed. Finding a suitable word for describing the phenomenon of steaming is discussed. *Subject Headings:* **1. Forest steaming 2. Condensation 3. Cloud formation.**—*I.L.D.*

4.5–158 551.574.1

Salles, E., **Remarques sur la teneur de l'air en noyaux de condensation, en la compagne.** [Note on the condensation nuclei content of air in the country.] *La Météorologie*, 4th Ser., No. 12:300–303, Oct./Dec. **1948. DWB**—Data obtained by the author with two types of Aitken nuclei counters (the pocket and the portable) in various parts of France, show the frequency or distribution of nuclei in 3 localities, including one large town, one small coastal village and one forest area. These are compared with data published by LANDSBERG for rural districts inland and along the coasts and for cities, respectively. The author obtains lower values than the averages of LANDSBERG; agrees with those of AITKEN and LÀ along the Riviera; but much higher than in Scotland or Ireland. *Subject Headings:* **1. Condensation nuclei 2. Aitken counters. I. Landsberg, Helmut E.**—*M.R.*

4.5–159 551.574.1:551.508.91

Vonnegut, Bernard and Neubauer, Raymond (*Gen. Electric Res. Lab., Schenectady*), **Detection and measurement of aerosol particles.** *Analytical Chemistry*, Wash., D. C., 24(6):1000–1005, June **1952.** 12 figs., 6 refs. **DLC**—Size and number of liquid particles in a flow of air is determined by measuring the change in the intensity of an electric current flowing through a hot wire whose resistance decreases through loss in heat due to evaporation of particles colliding with it. The apparatus used for this experiment at Schenectady is described and shown in diagrams. Some of the variables such as wire size and composition, air speed, heating current, drop size and composition are discussed and their qualitative relations shown in graphs. A uniform drop generator used as accessory equipment is described. Qualitative results have been obtained so far and the instrument is expected to yield quantitative results when further developed. *Subject Headings:* **1. Aerosol detection 2. Aerosol measurement.**—*G.T.*

4.5–160 551.575

Sea fog. *Meteorological Magazine*, London, 81(962):249, Aug. **1952.** 6 photos. **MH-BH**—Photographs from 6000 ft of a fog bank over North Sea, April 30, 1942. Width 10–50 mi, top at 500 ft. *Subject Headings:* **1. Sea fog 2. North Sea.**—*C.E.P.B.*

CLOUDS

See also: 4.5–7, **Cloud form classification** (Howell); 4.5–11, **Thermodynamics of clouds** (Möller); 4.5–155, **Cloud physics** (Coulomb, Loisel); 4.5–156, **Electron-microscopic study of cloud and fog nuclei** (Ogiwara, Okita); 4.5–157, **Forest steaming after rain, distinction between water vapor and water steam** (Rossmann).

4.5–161 551.576.1

*Kimachi, T. (*Yonago Weather Station, Japan*), **Studies on the meteorological elements of high cloud.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 30(9):296–303, Sept. **1952.** 6 figs., 8 tables, 4 refs. In Japanese, English summary p. 296. **DWB**—Meteorological conditions prevailing in transitional layers between two air flows, where high clouds form, are investigated. Temperature lapse rate in such layers is found to range from about 0.2 to 0.4°C/100 m. Tables are presented on observed height, velocity and thickness of high clouds, on their temperature (−10 to −50°C), on deviations of height of cloud from height of transitional layer, and on the relation between temperature lapse rate and state of the sky. *Subject Headings:* **1. Cloud formation 2. Cloud height 3. Vertical temperature gradient.**—*G.T.*

4.5–162 551.501.1:551.576.1(02)

Spain. Servicio Meteorológico Nacional, **Atlas reducido de nubes.** [Abridged cloud atlas.] *Spain. Servicio Meteorológico Nacional, Publicación, Ser. C, Instrucciones*, No. 12, **1943.** 16 p. photos. **DWB**—The various cloud forms are described, the international code designations given and a portion of the international cloud atlas reproduced for the benefit of observers in Spain. One example is given for each main cloud type. *Subject Headings:* **1. Cloud atlases 2. Observers manuals 3. Spain.**—*M.R.*

4.5–163 551.576.12:37

Germany. Meteorologisches Amt für Nordwestdeutschland, **Die Wolken.** [Clouds.] *Germany. Meteorologisches Amt für Nordwestdeutschland, Wetterkundliche Lehrmittel*, No. 9, [1950?] unpaged. 32 illus. **DWB**—One in a series of aids for teaching meteorology in elementary and high schools. Thirty-two pictures of the most important cloud forms are presented with explanations, giving the physical explanation of the phenomena. *Subject Headings:* **1. Teaching of meteorology 2. Cloud classification.**—*A.A.*

4.5–164 551.576.2:551.585.1(261)

Markgraf, H., **Klimazonen der Meere im Spiegel der Bewölkung.** [Climatic zones of the oceans in the light of cloudiness.] *Wetterlotse*, 41:97–100, June **1952.** 2 figs. **DWB**—Relations of cloudiness to climatic zones in N. Atlantic are illustrated by frequency histograms of clear, cloudy and overcast skies for 6 points, lat. 60° to 25°N. *Subject Headings:* **1. Cloudiness 2. North Atlantic Ocean.**—*C.E.P.B.*

PRECIPITATION

See also: 4.5–31, **Interpolation method for precipitation** (Usami); 4.5–74, **Rain forecasting aid** (Diaz); 4.5–182, **Unit hydrograph lag and peak flow related to basin characteristics** (Taylor, Schwarz); 4.5–208, **Berg's contribution to climatology** (Alisov); 4.5–240, **Application of radar to meteorology** (Jones).

4.5–165 551.577:63(44)

*Bricault, R. and Striffling, Maurice, **Pluies et agriculture dans la région lyonnaise.** [Rainfall and agriculture in the Lyon region.] *La Météorologie*, 4th Ser., No. 25:1–6, Jan./March **1952.** 2 figs., table, 5 refs. French, English and Spanish summaries p. 1. **DWB**—Monthly averages of total precipitation (H), of effective precipitation (H_e=1 mm per hour, which is the estimated average absorption capacity of the soil) and of the efficiency coefficient $\frac{H_e}{H}$ are tabulated for Bron, France, for the periods 1930–1939, 1940–1949 and 1930–1949. The variation of the efficiency coefficient is graphically presented. It shows highest values in

Dec.–Feb., lowest in July–Sept. *Subject Headings:* **1. Precipitation effectiveness 2. Agricultural meteorology 3. Bron, France.**—*G.T.*

4.5–166 551.577 551.578.42

*Finland. Ilmatieteellinen Keskuslaitos, **Sade- ja Lumihavaintoja Suomesta, Vuonna 1939, 1940. Niederschlags-schneebeobachtungen in Finnland im Jahre 1939, 1940.** [Precipitation and snow observations in Finland 1939, 1940.] *Finland. Ilmatieteellinen Keskuslaitos, Suomen Meteorologienen Vuosikirja*, v. 39, Pt. 2, **1939**; v. 40, Pt. 2, **1940.** (Helsinki, 1950, 1951.) 2 pieces. Mostly tables; sometimes in Finnish and German. **DWB**—A table in the introduction lists 453 precipitation and 137 snow observation stations by name, position, altitude and river valley. The body of the report consists of a series of tables showing daily precipitation, monthly and annual total precipitation, snow depth, and a comparison between snow depth in the woods and in the open. Charts illustrate the precipitation tables. Some data from eastern border stations are incomplete due to the war. *Subject Headings:* **1. Precipitation networks 2. Precipitation data 3. Snow cover 4. Finland. I. Korhonen, V. V.** (*ed.*) **II. Angervo, J. M.** (*ed.*).—*M.P.K.*

4.5–167 551.577:06(09)(410)

Glasspoole, John, **The British Rainfall Organization.** *Weather*, 7(3):85–87, March **1952. DWB**—History since beginning of collection of rainfall records by G. J. Symons in 1859. *Subject Headings:* **1. British Rainfall Organization 2. History of meteorological organizations.**

4.5–168 551.577:551.506.3:551.501(46)

*Gonzalez Quijano, Pedro Miguel (*Spain*), **Mapa pluviométrico de España.** [Precipitation chart of Spain.] Madrid, **1946.** 574+p. 8 fold. color charts in separate cover, numerous tables, diagrs., charts. **DWB**—A most thorough presentation of all available rainfall data for Spain in the form of text, tables and small and large (colored) charts. Theories of cloud physics and natural and artificial rain formation are considered extensively (not effective according to author, who had not heard of Langmuir and Schaefer); methods of measuring rain, errors, representativeness, autocorrelation; variability, air mass and frontal concepts, statistical methods; isohyetal charts, effect of altitude and topography, density of stations necessary, observational material used in this study, earliest records (1786), observatories, networks, Portuguese observatories, homogeneity and adjustment of data; description of detailed color charts, orographic and marine influences evident from charts; analysis of all available data in every conceivable manner and annual isohyetal maps of Iberian Peninsula 1871–1920. Actual annual data for scores of stations are tabulated beginning with 1791 at Gibraltar, 1805 at San Fernando, and 1839 at Cadiz and continuing to 1940 in many instances. An alphabetical index of stations, useful conversion tables and mean monthly precipitation for period 1901–30 are appended (54 stations in Spain, 2 in Balearic Islands and 16 in Portugal and the Azores). Elaborate statistical studies of the data are also appended, showing extremes, frequencies in various class intervals, etc., both graphically and tabularly, with lengthy discussion of statistical methods used and tests of significance. *Subject Headings:* **1. Precipitation studies 2. Isohyetal charts 3. Rainfall networks 4. Long period records 5. Spain 6. Portugal. I. Spain. Consejo Superior de Investigaciones Científicas, Instituto Juan Sebastían Elcano de Geografía.**—*M.R.*

4.5–169 551.577.2:551.577.5

Serra, Louis (*Électricité de France*), **Interprétation des mesures pluviométriques; Lois de la pluviosité.** [Interpretation of rainfall measurements; Rainfall laws.] *La Houille Blanche*, Grenoble, v. 7, Separate No. B:491–505, July **1952.** 18 figs. French and English summaries p. 491. **DLC.** Also in: *Société Hydrotechnique de France, Paris, Mémoires and Travaux*, No. 2:141–155, **1952.** And: *Interational Union of Geodesy and Geophysics. International Association of Scientific Hydrology, Brussels, 1951* [*Transactions*], v. 3:9-25, **1952. DWB**—The relation between hydrological rainfall (quantity of water received per unit area of soil) and meteorological rainfall (amount received on a horizontal surface) is determined by accounting for the effect of slope, angle of incidence, wind, gustiness and turbulence. A

rainfall formula composed of the elements of orography, altitude and distance from the sea is suggested and illustrated by graphs and a chart. A discussion which followed the delivery of the paper is reproduced. *Subject Headings:* **1. Rainfall distribution 2. Orographic influences.**—*G.T.*

4.5–170 551.577.37(753)

§Carr, J. A. (*WBAN Analysis Center, U. S. Weather Bureau, Washington, D. C.*), **The prolonged rain period over the Atlantic coastal states, April 23–29, 1952.** *Monthly Weather Review*, 80(4):73–76, April 1952. 8 figs., 4 refs. **MH-BH**—The development of a synoptic situation marked by the movement of a cold front from the north and of a low center originating over Georgia and resulting in 137 hours of almost continuous rainfall over Washington, D. C. between April 23 and 29, is described and commented on. The account is illustrated by surface, 700 mb, and 500 mb charts and a 24-hour precipitation chart for the eastern U. S. The total rainfall recorded at the Washington City Office was 5.28 in. during the 6-day period. *Subject Headings:* **1. Rainy spells 2. Excessive rainfall 3. Synoptic studies 4. Washington, D. C.**—*G.T.*

4.5–171 551.577.3:632.7

Davies, D. E., **Seasonal breeding and migrations of the desert locust (*Schistocerca gregaria* Forskal) in North-eastern Africa and the Middle East.** *Anti-Locust Memoir*, London, No. 4, 1952. 56 p. 13 maps, tables, 88 refs. **GB-MO**—Seasonal movements and breeding seasons are related to rainfall seasons. Four breeding periods are distinguished, Monsoon, Winter-early spring, Main spring and Pre-monsoon or Seif. *Subject Headings:* **1. Locusts 2. Rainfall variations 3. Northeast Africa 4. Middle East.**—*C.E.P.B.*

4.5–172 551.577.3(438)

Guminski, Romuald, **Izanomale rocznych sum opadu na terenie Wielkopolski i Pojezierza Pomorskiego.** [Annual isanomals of precipitation in northwestern Poland.] *Przegląd Meteorologiczny i Hydrologiczny*, v. 1950/1951:84–90, 1951. map, 6 refs. **DWB**—A new formula for calculating the annual isanomals of precipitation, elaborated on mean values of 40 years for 775 stations located in North-Western Poland. *Subject Headings:* **1. Precipitation anomalies 2. Poland.**—*W. Tomczykowski.*

4.5–173 551.577.33 551.590.22

van der Bijl, Willem, **Insuffisance d'une preuve statistique de l'influence de la Lune sur les précipitations atmosphériques.** [Inadequacy of statistical evidence of lunar influence on atmospheric precipitation.] *Académie des Sciences, Paris, Comptes Rendus*, 235(1):22–23, July 7, 1952. 2 refs. **DWB**—Discussion of an article published by H. Mineur in *Comptes Rendus*, 1951 (*see item* 3.11–202, Nov. 1952, *MAB*). The author offers seven arguments based on statistical considerations, all of which appear to point toward the assumption that the rainfall data analyzed by Mineur are independent of lunar influences. *Subject Headings:* **1. Lunar influences 2. Precipitation variations.**—*G.T.*

SNOW

See also: 4.5–111, **Albedo of snow surface with reference to its age** (Miller); 4.5–144, **Japanese building standard;** 4.5–166, **Precip. and snow, Finland, 1939, 1940.**

4.5–174 551.578.4:001

Minnesota. University. Institute of Technology. Engineering Experiment Station, **Interim Report to Snow, Ice and Permafrost Research Establishment.** *U. S. Corps of Engineers. Snow, Ice and Permafrost Research Establishment, SIPRE Report* No. 1, Jan. 1950. chart, tables. **DWB**—The fields of formation, metamorphism, ablation and degradation of snow, ice and frozen ground are divided into detailed research sections. General and military operations dependent on snow and ice conditions are classified. Present-day results of investigations are summed up and future projects recommended. Several appendexes giving terminology, symbols, relation of military objectives to recommended projects, etc. are

attached. Location of existing research facilities in Canada and United States are shown on a chart. *Subject Headings:* **1. Snow research 2. Ice research 3. Definitions 4. Military operations. I. Jordan, Richard C. II. Contract W-21-018-eng-676.**—*G.T.*

4.5–175 551.578.4:019.941

†Minnesota. University. Institute of Technology. Engineering Experiment Station. **Review of the properties of snow and ice.** *U. S. Corps of Engineers, Snow, Ice and Permafrost Research Establishment, SIPRE Report* No. 4, July **1951.** 156 p. graphs, tables, refs. eqs. **DWB**—Research on snow and ice is reviewed in sections on mechanical properties, ultimate strengths, electrical, geometric, thermal and radiation properties of snow and ice, phase relations, supercooling and ice formation on open water. Each section is divided into several subsections and discussed in detail. Some 165 papers used in compiling this compendium are quoted and abstracted in an appendix. *Subject Headings:* **1. Snow research 2. Ice research 3. Abstracts. I. Mantis, Homer T.** (*ed.*) **II. Contract W-21-018-eng-676.**—*G.T.*

4.5–176 551.578.46:061.3(78)

U. S. Corps of Engineers and U. S. Weather Bureau, **Cooperative snow investigations. Annual Progress Report 1950–51.** *U. S. Corps of Engineers and U. S. Weather Bureau, Cooperative Snow Investigations, Technical Report,* No. 6–5, Nov. **1951.** 26 p. **DWB**—This report includes accounts of the operation of the Central Sierra, Upper Columbia and Willamette Basin snow laboratories, of Snow Ice & Permafrost Research Establishment, of Project CW-170 at Central Sierra Laboratory and activities of Weather Bureau and Corps of Engineers analysis units and of Project CW-171. The summaries were prepared for a conference of the cooperative program held on May 1–2, 1951. Notes on the resolutions passed by the conference are added. *Subject Headings:* **1. Snow research 2. Snow cover 3. Conferences 4. Western States. I. Central Sierra Laboratory.**—*G.T.*

4.5–177 551.578.71(443.6)

Tomieu, P., **Une chute de grêle exceptionelle.** [An unusual hailstorm.] *La Météorologie,* 4th Ser., No. 25:37, Jan./March **1952. DWB**—The hailstorm described in this note was observed at Saint-Maur, near Paris, on Aug. 30, 1951. Its outstanding feature was the unusual size of hail stones rather than its intensity. Their average diameter is estimated at 25 mm, and the author collected many with diameters ranging from 30 to 38 mm. A pear-shaped piece had a semi-spherical head of 20 mm diameter and a length of 50 mm. *Subject Headings:* **1. Hailstorms 2. Hailstone size 3. Saint-Maur, France.**—*G.T.*

HYDROMETEOROLOGY

See also: 4.5–217, **Forest influence of hydrological conditions** (Debski).

4.5–178 551.579.2 551.501:551.506

*U. S. Corps of Engineers, **Criteria for estimating runoff from snow melt.** Project CW-171, Technical Bulletins, Nos. 4, 8–10, Apr. 10, May 26, Sept. 5, **1950.** 4 pieces. tables, graphs. **DWB**—In Bull. No. 4, D. W. HULLINGHORST presents comparative data on observed hourly discharges of Castle Creek, Central Sierra Snow Laboratory, for April 1947 and two-hourly estimated discharges. The discharge estimates are based on expected amounts of snow melt in the basin, computed from available values of temperature, wind, humidity, sunshine and cloudiness, and accounting for long- and short-wave radiation and convective exchange. Good agreement is found between estimated and measured runoff. Bull. No. 8, by D. W. HULLINGHORST and D. H. MILLER, presents a more detailed description of the method used in computing the hourly values of temperature, wind speed, radiation, vapor pressure, cloudiness, etc. from which hourly values of estimated snow melt and, finally, of runoff were obtained. Samples of data are presented and explained. Bull. No. 9 supplements some values given in Bull. No. 8. In Bull. No. 10, by R. M. HAMILTON, the relationships obtained for 1947 (Bull. 4, 8, 9) are applied to data available for 1946 (with roughly 50% more snow). Actual and estimated hydrographs for April 1946 are compared in the same way as in Bull. No. 4. *Subject*

Headings: **1. Snow melt 2. Runoff 3. Castle Creek, Calif. I. Project CW-171 II. Hullinghorst, D. W. III. Miller, D. H. IV. Hamilton, R. M.**—*G.T.*

4.5–179 551.579.4(497.1)

*Pečinar, Miladin M., **Opšti katastar voda za reke Dunav i Tisu.** [General survey of Danube and Tisza rivers.] *Yugoslavia. Hidrometeorološka Služba. Hidrometeorološki Glasnik*, 3:86–91, **1950.** 6 figs. In Serbian. **DWB**—In 1949 the Hydrometeorological Service started a general survey of the hydrologic resources in Yugoslavia. This is a report of the presented outline, the first in a series of similar investigations. The graphs show the increase in the water supply from the tributaries of the Danube (Drava, Tisza and Morava), monthly and extreme variations of the runoff on the Danube near Panchevo for the period 1921–1940, and the variations of the river level. The author states that the Danube gets its main water supply from the territory of Yugoslavia since the mean runoff increases over the territory from 2200 m^3/sec up to 6090 m^3 sec., i.e., in the relation of 1:2.75. *Subject Headings:* **1. Water supply survey 2. Water level variations 3. Runoff 4. Danube River 5. Tisza River 6. Yugoslavia.**—*N.T.Z.*

4.5–180 551.579.4:628.1

*Renner, E. (*Offenbach, Ger.*), **Hochwasserschaden und Hochwasserschutzmassnahmen in Asien und dem fernen Osten.** [Flood damage and flood control activities in Asia and the Far East.] *Wasserwirtschaft*, Stuttgart, 48(6):212–217, March **1952.** 6 figs., 2 tables. **DWB**—Review of a 81-page report with 26 maps and charts (the first in a series of publications) which was issued under the above English title in October 1950 by the United Nations Bureau for Flood Control of the Economic Commission for Asia and the Far East (with headquarters at Bangkok). Hydrological data for 19 rivers and temperature and precipitation data for 6 stations are presented. It is pointed out that monthly precipitation amounts in some regions are equal to yearly amounts in German cities like Frankfurt a.M. The water level of the Yangtse River near Chungking may rise 10 m within 24 hours. The historical development of flood control in the Damodar, Yangtse and Kalani River area is outlined. *Subject Headings:* **1. Floods 2. Flood damage 3. Flood control 4. Hydrologic data 5. Far East.**—*G.T.*

4.5–181 551.579.4(44)

Sanson, J., **Les années se suivent . . . et ne se ressemblent pas.** [The years follow one another . . . and are never the same.] *La Météorologie*, 4th Ser., no. 23:221–222, July/Sept., **1951.** 3 figs. French, English and Spanish summaries p. 22. **MH-BH**—Photos showing flood conditions on the Aveyron River (France) on May 31, 1951 in contrast to conditions during the flood of Aug. 1949, are presented and the hydrometeorological situation described briefly. Other great floods occurred in 1906, 1929, 1930, 1935 and 1937. *Subject Headings:* **1. Floods 2. Aveyron River, France.**—*M.R.*

4.5–182 551.579.4:551.482:551.577.37

Taylor, Arnold B. and Schwarz, Harry E., **Unit-hydrograph lag and peak flow related to basin characteristics.** *American Geophysical Union, Transactions*, 33(2):235–246, April **1952.** 8 figs., table, 6 refs., 19 eqs. **DWB**—Characteristic basin data and duration of storm excess data for 20 basins ranging from 20 to 1600 sq.mi. of drainage and located in the north and Middle Atlantic States were used to construct unit-hydrograph values from 65 rainfall excess periods. The unit hydrograph lag and peak-flow values have been related empirically to basin characteristics and to the duration of rainfall excess. The most significant basin characteristics are shown to be drainage area, length of longest watercourse, length to center of area and equivalent mainstream slope. Graphs of correlation studies are given and a method for determining equivalent mainstream slope is presented. A nomograph for computing unit hydrographs based upon the equations developed in the study is included. The data presented will aid in the determination of unit hydrographs in ungaged watersheds in similar areas. *Subject Headings:* **1. Hydrographs 2. Drainage 3. Excessive rainfall 4. Stream flow 5. North Atlantic States.**—*From authors' abstract.*

4.5–183 551.579.5

Childs, E. C., **The measurement of the hydraulic permeability of saturated soil *in situ*. . Principles of a proposed method.** *Royal Society of London, Proceedings, Ser. A*, 215(1123): 25–535, Dec. 22, **1952.** 3 figs., table, 6 refs., 21 eqs. **DWB**—Hydraulic permeability is lefined as the constant K in $v = -K$ grad ϕ where v is flow in cc/sec/cm² and ϕ is potential in rgs/unit vol of fluid. To find the true horizontal permeability in anisotropic soils, the level n a small well (15 cm diameter) is depressed by pumping water from it through a meter to second well (91 cm distant) raising the level in the latter. From difference of level and flow f water in a steady state, soil permeability can be calculated. The expression is compared vith that for D. KIRKHAM's single well method. With 3 wells permeability in 2 directions an be found. Corrections for vertical flow will be described later. *Subject Heading:* **1. Per- neability.**—*C.E.P.B.*

4.5–184 551.579.5:631.62

Hellinga, F. (*Prof., Graduate School of Agri. Wageningen, Netherlands*), **Soil and water ontrol programs.** (In: United Nations Scientific Conference on the Conservation and Jtilization of Resources, Lake Success, N. Y. 1949, **Proceedings, v. 4. Water Resources,** . 363–366, **1951.** 6 tables, 9 refs.) **DWB**—Report on work done in the Netherlands, where bout 55% of the land lies below the level of the sea or of adjacent rivers. The climatic onditions require a drainage capacity of 10 to 14 mm/24 hours, the installation of which osts from $375 to $575 per hectare with current working costs from $4 to $7 per hectare. The relation between yield of crops and drainage conditions is shown and the meteorological nfluences on drainage are briefly discussed. *Subject Headings:* **1. Drainage 2. Agricultural ydrology 3. Crop yield 4. Netherlands.**—*A.A.*

4.5–185 551.579.5:551.311:631.4(497.1)

Pećinar, Miladin M., **Konservacija tla; zaštita tla od erozije.** [Soil conservation; pro- ection of the soil against erosion.] *Yugoslavia. Hidrometeorološka Služba, Belgrade, Publi- acije* [unnumbered], **1948.** 30 p. In Croatian. **DWB**—Basic facts on the mechanical, hermal and chemical components of erosion are offered. Positive and negative effects of uman activities on the vulnerability of the soil are discussed. Three categories of soils are et up: soils that resist erosion without protection, soils which need grass cover for protection nd soils requiring the protection of forests. Various regions of Yugoslavia are described in etail and human activities which have led to their deterioration pointed out. The hydro- ogical situation in Yugoslavia is summed up. Requirements of optimum use of the soil are stablished and applied to Yugoslavia. Suggestions are offered in general terms. *Subject Headings:* **1. Erosion 2. Soil conservation 3. Soil moisture 4. Yugoslavia.**—*G.T.*

4.5–186 551.579.5:699.8

Ward, W. H., **Soil movement and weather. Sec. 4.** *Great Britain. Dept. of Scientific nd Industrial Research. Building Research Station, Note*, No. E 383, **1952.** 9 p. 8 figs., tables, 7 refs. English, French summaries p. 1–2. Mimeographed.—Observations were ade in heavy clay in S. England under rough grass and bare soil with raingage, borehole for round water and gages for vertical ground movement at surface and depths up to 8 ft. Meth- ds of relating ground water deficit to vertical shrinkage are described. Water-shrinkage actor $\Delta w/\Delta z$ (w = inches of water, z vertical soil movement, inches) was 4.0–5.5. Shrinkage nder bare soil was less than under grass or near trees. *Subject Headings:* **1. Ground water . Building construction.**—*C.E.P.B.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

See also: 4.5–9, **Climate and British scene** (Manley).

4.5–187 551.58:62

Keil, W., **Bemerkungen über Klima und Betriebsklima.** [Remarks on climate and actory climate.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:281–

283, 1952. **DWB**—The effect of climate on artificial processes is of increasing importance—manufacturing, performance of engines, efficiency of workers and temperature correction of barometers and clocks. General article. *Subject Heading:* **1. Industrial meteorology.**—*C.E.P.B.*

4.5–188 551.58:71/2(04)

Landsberg, Helmut Erich, **Climate and planning of settlements. Address before Convention, Symposium I, "Urban and Regional Planning," American Institute of Architects, Washington, D. C., May 10, 1950.** 5 p. Mimeographed.—Early designs of houses and layout of towns to offset climate have been neglected because of migrations and technical developments ("gadgets"). The address pleads for intelligent regard for climate in planning, including all elements, and especially microclimatology. Housing development around Washington, D. C., is used as an example. *Subject Headings:* **1. City planning 2. Building design 3. Microclimates 4. Washington, D. C.**—*C.E.P.B.*

4.5–189 551.58:9

Spate, O. H. K., **Toynbee and Huntington: a study in determinism.** *Geographical Journal*, London, 118(4):406–428, Dec. **1952.** refs. Discussion p. 424–428. **DWB**—A philosophical discussion of the effect of physical environment, including climate and climatic changes, on history and human geography. *Subject Headings:* **1. Climatic effects I. Toynbee, P. II. Huntington, E.**—*C.E.P.B.*

4.5–190 551.58:551.521.1(68)

*de Villiers, G. D. B., **Studies on the solar climate of Stellenbosch. Pt. 1, Light intensity. Pt. II, Duration of bright sunshine.** *South Africa. Dept. of Agriculture. Fruit Research, Technical Series*, No. 23, **1949.** 23 p. 6 figs., 5 tables, 3 refs. Price: 3 d. **DWB**—Description of measurements of light intensity during a few days in 1937 is given. The sunshine duration was measured over a period of five years. The data are presented and the results discussed. The relationship between rainfall and sunshine duration is examined. Temperature and rainfall data are given. *Subject Headings:* **1. Solar climate 2. Sunshine duration 3. Light intensity 4. Climate of Stellenbosch, South Africa 5. Stellenbosch, South Africa.** —*A.A.*

4.5–191 551.581:69(213)(6)

Jennings, J. E., Roux, A. J. A. (*Nat. Bldg. Research Inst., C.S.I.E. Pretoria*), and Connell, P. H. (*Univ. of Natal*), **Housing in hot climates.** (In: African Regional Scientific Conference, Johannesburg, Oct. 17–28, 1949, 2:364–367, **1950.** In English, French summary p. 364.) **DWB**—The high atmospheric temperature and radiation of Africa gives rise to special building problems which involve comfort considerations and economic and design factors. The author reviews briefly some of the research work carried on in South Africa on the thermal balance of buildings, on the deterioration of paint and bituminous films, vermiproofing of buildings, effect of arid climates on foundation soils, on building design for outdoor living and details of house design. *Subject Headings:* **1. Building construction 2. Tropical climatology 3. Africa.** —*I.L.D.*

CLIMATE OF PARTICULAR PLACES

See also: 4.5–213, **Ecological plant geography of Albania, its agricultural crops, N. American analogs** (Nuttonson).

4.5–192 551.582(669)

*British West Africa. Meteorological Services, **Preliminary note on the climate of Nigeria.** [n.d.] 4 p. 3 fold. charts, tables (in append.). Mimeographed. Last data cited—**1948.**—The characteristics of the wind systems, surface winds, rainfall, temperature, humidity, clouds, visibility and line squalls are outlined for Nigeria. A list of 25 stations with geographic coordinates and altitude is given. Tables include: 1) mean monthly rainfall, 2) monthly means of daily maximum and minimum and absolute maximum and minimum temperature, 3) mean

relative humidity and mean amount of cloud at 0600 and 1200 GMT, 4) percentage frequencies of surface wind direction at 00, 03, 06, 09, 12, 18 and 21h GMT at Kano and Ikeja, 5) percentage frequencies of surface wind of more than 3 mph at Enugu at above hours and 6) mean amount of cloud at these 3 stations at 0300, 0900, 1500 and 2100. The period of record varies; the longest being that for mean monthly rainfall at Lagos (47 yrs) but in some cases the record is for only 2 yrs. Charts show mean annual rainfall and mean maximum temperatures with histograms for selected stations. *Subject Headings:* **1. Climate of Nigeria 2. Climatic data 3. Nigeria.**—*M.L.R.*

4.5–193 551.582:72:697(73/9)

*Rogers, Tyler Stewart, Siple, Paul A., Queer, Elmer, Fisher, Howard T. and Callender, John Hancock (*Owens-Corning Fiberglass Corp.*), **Design of insulated buildings for various climates.** Toledo, Ohio, Roberts Printing Co., **1951.** 119 p. 8 tables, illus. **DWB**—A popular but practical work on how climate or weather affects comfort and building design with particular reference to conditions in the U. S., and based on weather and materials data accumulated for this purpose during and since the war. The major sections deal with: 1) Heat control (effect of materials in controlling conduction, convection, reflection, etc. in summer and winter); 2) Vapor control (condensation, insulation, vapor barriers, summer condensation); 3) Ventilation (effect of wind movement, air cooled walls and roofs, design for hot or sunny climates) and 4) Design data for practice with respect to roofs, ceilings, walls, floors and the calculations of design data. Many climatic tables and maps, photos and schematic diagrams, and an elaborate index add to the usefulness of this volume. *Subject Headings:* **1. Climatic effects 2. Building design 3. Heating and ventilating 4. Indoor climates 5. United States.**—*M.R.*

4.5–194 551.582(667)

*Walker, H. O. and Swan, A. D., **The climate of the Gold Coast.** *Gold Coast. Meteorological Service, Accra, Meteorological Note*, No. 1, **1952.** 28 p. 9 tables, 9 refs. Mimeographed. **DWB**—Summaries based mainly on reliable records 1947–1951 for 13 stations are given and discussed. Tables include wind direction, rainfall, raindays, daily and absolute extremes of temperature, relative humidity, cloud amount, sunshine, thunder. *Subject Headings:* **1. Local climates 2. Climate of the Gold Coast 3. Gold Coast.**—*C.E.P.B.*

4.5–195 551.582.1:(58)06(09)

Molchanov, L. A., **Klimaticheskie issledovaniia Uzbekistana.** [Climatic investigations in Uzbekistan.] (In: Uzbekistan. Komitet Nauk, **Nauka v Uzbekistane za 15 let.** (1929–1939). [Science in Uzbekistan for 15 years (1929–1939).] Tashkent, **1939.** p. 2–23.) **DLC**—Brief history of meteorological network and service in Uzbekistan, especially of the Tashkent Observatory (est. 1876) which has been the central administration point. Systematic climatological and agrometeorological investigations were begun in 1921. An important phase of the activity has been the establishment of mountain meteorological stations and networks of rain gages to study rainfall and other climatic effects in high mountains (ca. 1928). A list of important publications on the climate of Uzbekistan and central Asia (1912–1934) is given. *Subject Headings:* **1. Climatic surveys 2. History of meteorological services 3. Publication lists 4. Tashkent Observatory, Uzbekistan 5. Uzbekistan, U.S.S.R.**—*M.R.*

4.5–196 551.582.1(987, 71)

*Rae, R. W. (*Met. Div. of Canada*), **Climate of the Canadian Arctic archipelago.** Toronto [Meteorological Division of Canada] **1951.** 90 p. 15 figs., tables, 11 refs. Price: $.35. **DWB**—Description of climatic controls (latitude, air pressure, distribution of land, water, ice and topography) and of the distribution of climatic elements. Data (averages for each month and the whole observation period) are added for 20 stations with observation periods from 2 to over 20 years (average about 10 years) for temperature, precipitation, cloudiness, visibility and wind. Charts are given for mean pressure and temperature distribution. *Subject Headings:* **1. Climate of the Canadian Arctic 2. Climatic data 3. Canadian Arctic I. Canada. Meteorological Division.**—*A.A.*

4.5–197 551.582.1(56):551.583.3

Rathjens, Carl, **Der Uludağ.** [The Ulu Dağ.] *Leben und Umwelt*, 9(3):66–72, Dec. **1952.** 4 figs. **DWB**—Account of a mountain massif in N.W. Anatolia (2550 m). Remains of quaternary glaciation on this climatic island described in relation to present climate, vegetation and settlements. *Subject Headings:* **1. Local climates 2. Quaternary climates 3. Ulu Dağ, Armenia.**—*C.E.P.B.*

4.5–198 551.582.2

*Great Britain. Meteorological Office, **Temperature, rainfall and humidity tables. Europe, Asia, Africa, America, Australasia, oceans and islands.** 6 vols. [1952?] all tables. Mimeographed. **GB-MO**—Each of these volumes includes sheets for numerous stations, classified by states. The tables give for each month averages of daily and monthly maximum and minimum temperature and absolute extremes, average relative humidity at different hours, average rainfall, greatest fall in 24 hours, and number of days with 0.04 in. or more. A period of years is stated in each case. A very useful climatological tabulation. *Subject Headings:* **1. Climatic data 2. World climate 3. World.**—*C.E.P.B.*

4.5–199 551.582.2(87)

*Vila, Marco-Aurelio, **Aspectos geográficos del Zulia.** [Geographical aspects of Zulia.] *Corporación Venezolana de Fomento, Caracas, Monografías Económicas Estadales*, [v. 3] **1952.** 304 p. photos, tables, maps, bibliog. p. 301. **DWB**—This book contains a chapter (p. 81–98) dealing with the climate of this state, situated in the northwestern part of Venezuela, 11% of whose area is elevated 100–1000 m above sea level. Temperature, precipitation, evaporation and wind regimes of the region are described. Tabulated data are presented on annual means of climatic elements for 21 stations and monthly means for Maracaibo (State capital) and Lagunillas. *Subject Headings:* **1. Climatic data 2. Zulia, Venezuela.**—*G.T.*

CLIMATIC CHANGES

See also: 4.5–1, **Changing the climate to transform nature of arid regions of U.S.S.R.** (Budyko and others); 4.5–3, **Solar energy–possible cause of anomalous weather changes** (Craig, Willett); 4.5–5, **Glacier research** (Flint); 4.5–30, **Amateur weathermen's Almanach;** 4.5–120, **Periodicity of abnormal temp., Miyako** (Fukuda); 4.5–197, **Ulu Dag** (Rathjens).

4.5–200 551.583.13:551.590.23

Gillette, Halbert Powers (*ed. "Roads and Streets"*), **More on weather cycles and their causes.** *Water and Sewage Works*, San Marino, Calif., 99(3):102–106, March **1952.** 2 figs. Abstracted from reprint. **DWB**—The author presents the dubious theory that various planets cause either sunspots or rainfall or both and determine weather when they are in conjunction by producing an abnormal number of solar ion streams, that the earth causes sunspots by its magnetic effect upon the sun, and that tree ring cycles, temperature cycles and varves indicate the extreme of weather cycles which are of planetary origin. *Subject Headings:* **1. Weather cycles 2. Planetary influences.**—*I.L.D.*

4.5–201 551.583.3

Sears, Paul B. and Clisby, Kathryn H., **Two long climatic records.** *Science*, Wash., D. C., 116(3007):176–178, Aug. 15, **1952.** fig. **DWB**—Two secular moisture records ranging back as far as 75 centuries are presented in terms of percent of moisture indicators found in pollen sediments. The data presented were obtained in northern New Mexico and in Mexico City, respectively. "A strikingly consistent alternation of moist and dry intervals" is found to exist in both sites which are about 1600 miles apart. The authors advocate the hypothesis that moist conditions represent ice advance while dry periods indicate retreat. *Subject Headings:* **1. Climatic changes 2. Secular climatic records 3. Pollen analysis 4. New Mexico 5. Mexico City, Mexico.**—*G.T.*

4.5–202 551.583.3:551.311.12

Pauly, Karl A., **The cause of the great ice ages.** *Scientific Monthly*, New York, 75(2):89–98, Aug. **1952.** 3 figs., 3 tables. **DLC**—Conditions prevailing before and during the Pleistocene Ice Age are investigated with a view to examining the correctness of a hypothesis according to which ice ages were caused by shifting of the earth's outer crust over the interior due to tidal friction. This interpretation was suggested by A. S. EDDINGTON in his paper "The borderland of geology and astronomy." The author presents data on the location of terminal glaciers during the Pleistocene period and at present, on the distribution of warm and cold climates preceding the Pleistocene period, on areas of coal deposits, etc., and concludes that the theory under investigation appears to be fully justified. *Subject Headings:* **1. Ice age 2. Glaciation.**—*G.T.*

4.5–203 551.583.3:593:551.481

Grospietsch, Theodor, **Die Rhizopodenanalyse als Hilfsmittel der Moorforschung.** [Rhizopod analysis as an aid in bog investigation.] *Naturwissenschaften*, 39(14):318-323, July **1952.** 8 figs., table, 16 refs. **DLC**—Various species of these testaceous Protozoa flourish in different degrees of wetness, and their subfossil remains in peat bogs indicate alternations of rainfall and temperature in the Post-glacial. Besides the main warm period about 5000–2500 B.C., a late warm period is shown in Saxony about 600 B.C. *Subject Headings:* **1. Quaternary climates 2. Bogs.**—*C.E.P.B.*

MICROCLIMATOLOGY

See also: 4.5–157, **Forest steaming after rain, distinction between water vapor and water steam** (Rossmann).

4.5–204 551.584

Däniker, A. U., **Die Inseln von Brissago und ihre Bedeutung für die "Akklimatisation" fremdländischer Pflanzen.** [Brissago Islands and their importance for the "acclimatization" of foreign plants.] *Leben and Umwelt*, No. 1:1–8, Oct. **1951.** 3 photos.—Example of the influence of local climate on the acclimatization of plants. Short discussion of microclimatic possibilities for setting out tropical plants in a region of Switzerland sheltered from the north. *Subject Headings:* **1. Microclimates 2. Acclimatization of plants 3. Switzerland** —*A.A.*

4.5–205 551.584:551.501.9(09)(497.1)

Radošević, Milušin Dj., **Doprinos beogradske meteorološke opservatorije mikroklimatologiji.** [The contribution of the Belgrade Meteorological Observatory to microclimatology.] *Yugoslavia. Hidrometeorološka Služba. Hidrometeorološki Glasnik*, 1(2):65–69, **1948.** refs. In Croatian. **DWB**—Microclimatological measurements in Belgrade were started in 1949 by VL. JAKŠIČ and almost continuous records at a single location are available for the last 52 years. Investigations made at the observatory on air and soil temperature, on the vertical distribution of atmospheric temperature near the ground, on the effect of friction and of the presence of dust particles on air temperature and on temperature inversion and secondary maxima are claimed to have contributed toward a general progress in microclimatology. Publications reporting these investigations are referred to and some of them quoted as classics. *Subject Headings:* **1. Microclimatology 2. History of microclimatology 3. Observatories 4. Belgrade, Yugoslavia. Belgrade Meteorological Observatory 5. Yugoslavia.**—*G.T.*

4.5–206 551.584.41:551.588.6(438)

Maruszczak. Henryk, **Stan i zmiany lesistości uojewództwa lubelskiego w latach 1830–1930.** [The state and changes of the forest area in the province of Lublin in the years 1830–1930.] *Lublin. Universytet Marii Curie-Sklodowskiej, Rocznik, Annales, Sec. B*, 5(5):109–178, **1950.** 13 figs., 9 tables, 12 diagrs. Summary in English p. 175–178. **DWB**—A lengthy and detailed study of forest conditions in the Lublin region during 100 years (1830 to 1930). In the introduction, the effect of forests on climate, soil, temperature, humidity, precipitation, snow cover, surface and ground water, etc. and the need for reforestation and proper land use are outlined. The study is based mainly on detailed charts of forests in the region in 1830,

1890 and 1930. The author points out that the gradual but significant shrinkage of the forest areas has been accompanied by a drying up of the soil, a reduction of water reservoirs (caused by washing of denuded spaces) and a decrease of rainfall (shown in a diagram of annual amount of precipitation observed in Pulavy in the years 1874–1948). The third part of the paper is devoted to the problem of organizing a rational system of reforestation based on considerations of the quality of the soil, the demand for timber and the requirements of the water economy. *Subject Headings:* **1. Forest climatology 2. Forest influences 3. Lublin Region 4. Poland.**—*M.R., A.M.P.*

4.5–207 551.584.61

Feige, R., Koch, W., Neumann, J. and Wittkower, W. J., **Report on the indoor climate of two apartments.** *Israel. Meteorological Service, Series A, Meteorological Notes*, No. 7, 1952. 10 p. 6 figs., 10 refs. **MH-BH**—Observations of effective temperature and cooling rate in late summer were made in 2 similar apartments in Tel Aviv, with external walls to S and to E, respectively. Temperatures and effective temperatures were lower and cooling rates higher in S than in E room, especially with windows closed (about 1°C), but closing windows is only an advantage with nobody in the room. It is concluded that buildings with longer walls facing N and S give greater climatic comfort than those facing E and W. *Subject Headings:* **1. Indoor climates 2. Israel.**—*C.E.P.B.*

CLIMATIC CLASSIFICATION

See also: 4.5–40, **Mountain meteorological observatory at Sljeme, annual report;** 4.5–164, **Climatic zones of oceans in the light of cloudiness,** (Markgraf).

4.5–208 551.585:551.577.38

Alisov, B. P., **Vklad L'va Semenovicha Berga v klimatologiiu.** [Lev Semënovich Berg's contributions to climatology.] *Voprosy Geografii*, No. 24, Fizicheskaia Geografiia, p. 27–31. 1951. **DLC**—The author summarizes briefly BERG's system of climatic classification, and his studies on the problem of desiccation in middle Asia. *Subject Headings:* **1. Berg, Lev Semënovich 2. Climatic classifications 3. Desiccation.**—*I.L.D.*

BIOCLIMATOLOGY

See also: 4.5–61, **Remarks on cooling rate** (Pfleiderer).

4.5–209 551.586:595.7

Mills, Harlow B. (*Chief, Ill. St. Natural History Survey*), **Weather and climate.** *U. S. Dept. of Agriculture, Insects, the Yearbook of Agriculture*, 1952. p. 423–429. illus. refs. **DLC**—According to the author "climate governs the general distribution of insects; weather affects the numbers of insects within their areas of distribution and the fluctuation in numbers around the margins of the areas." It is not easy to determine all the climatic and weather factors affecting insects. The major factors, whose effect is obvious, are: prolonged spring rain, heavy pelting rain in early summer and low summer temperature. Sometimes a few days' difference in the occurrence of such phenomena can entirely change their effect. The author gives many examples of observed effects of temperature, rainfall, humidity and wind on life and propagation of various species of insects. *Subject Headings:* **1. Bioclimatology 2. Insects.**—*G.T.*

4.5–210 551.586:613.15

Flach, Emil, **Über kontinuierlich durchgeführte Kernzahlbestimmungen, ihre meteorologische und bioklimatische Bedeutung.** [On continuous nuclei counts, their meteorological and bioclimatic importance.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:258–264, 1952. 2 figs., 11 refs. **DWB**—Some results of continuous measurements in Berlin are quoted. They show the results of human action, air exchange, convection and air mass on air hygiene in a large town. *Subject Headings:* **1. Air-borne diseases 2. Berlin, Germany.**—*C.E.P.B.*

4.5–211 551.586:616(47)

Tribukh, S. L., **O roli nekotorykh faktorov v rasprostranenii grippoznykh zabolevaniĭ na hveĭnykh fabrikakh.** [The influence of different factors on the distribution of grippe cases n sewing factories.] *Gigiena i Sanitaria*, No. 2:20–26, **1952.** 4 tables. **DLC**—The relationhip between the incidence of grippe and meteorological conditions is examined. A negative orrelation with the temperature and a positive with the relative humidity were found to exist. The microclimate in factories is investigated. *Subject Headings:* **1. Industrial climatology . Medical meteorology 3. U.S.S.R.**—*A.A.*

4.5–212 551.586(02):628.8:656.6

Bullen, F. L., **The ventilation and heating of ships.** 3rd ed. Liverpool, Ch. Birchall & ons, **1950.** 176 p. 53 figs., 25 tables, 29 refs. Price:10/6. **GB-MO**—This useful textbook pens with a chapter on the density, heat content, etc. of dry and moist air. The volumes of ir required to maintain standards of purity and needs of humans and animals, and the standrd frequencies of air changes in different parts of a vessel are tabulated. Methods of ventilaion are examined, with special reference to efficiency of fans and ducts. Ventilation and efrigeration of cargoes, cooling and ventilation of engine rooms, and the ventilation and heating f crew and passenger accommodation are discussed, with chapters on air conditioning and esting. *Subject Headings:* **1. Heating and ventilating 2. Shipping 3. Textbooks.**—*C.E.P.B.*

4.5–213 551.586:63:58:551.582.1(496.5)

*Nuttonson, Michael Y., **Ecological plant geography of Albania, its agricultural crops and ome North American climatic analogues.** *International Agro-climatological Series, Study,* No. 6, **1947.** 16 p. tables. **DLC**—The geography, climate, plants and farm crops of Albania re discussed and analogues found in the Pacific Coast of the United States. A table ontaining data on mean monthly temperature, relative humidity and precipitation, on bsolute temperature and on precipitation effectivity indexes are presented for 8 meteorological tations. The location of the stations is shown on a chart with indication of altitude and eferences to North American climatic analogs. *Subject Headings:* **1. Agricultural climatology . Ecology 3. Climate of Albania 4. Climatic analogs 5. Albania. I. American Institute f Crop Ecology, Washington, D. C.**—*G.T.*

4.5–214 551.586:63

Petunin, I. M., **Nabliudeniia za sostoianiem zimuiushchikh posevov metodom otrahchivaniia.** [Observations on the state of winter sowings by the method of growth tests.] *Meteorologiia i Gidrologiia*, No. 3:34–36, Nov. **1950.** 2 figs. **DLC**—The author describes a nethod for determining the condition of winter sowings in the field in order to take protection neasures against frost or to substitute spring sowings. The method for taking samples of arth containing seeds by means of soil borers and necessary precautions for permitting the eeds to germinate and grow under suitable atmospheric temperature and in light are described. *Subject Headings:* **1. Agricultural climatology 2. Germination 3. Frost danger.**—*I.L.D.*

4.5–215 551.586:631.559

Gösele, L., **Über das Auftreten von Symmetrieerscheinungen an landwirtschaftlichem Ertragszahlenmaterial.** [On the occurrence of symmetry phenomena in agricultural yield tatistics.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:244–248, **1952.** 6 figs., table, 6 refs. **DWB**—Crop yields in Württemberg 1906–25 show both simple nd double symmetry points. *Subject Headings:* **1. Crop yield 2. Symmetry points 3. Württemberg, Germany.**—*C.E.P.B.*

4.5–216 551.586:636

Bergeiro Hargain, José Maríe, **El clima y la ganaderia; bio-climatologia pecuaria.** [Climate and animal husbandry; animal bioclimatology.] *Revista Orientación Meteorológica*, Montevideo, No. 6:21–28, Aug. **1951. DWB**—General aspects of the direct and indirect ffects of climatic and meteorological factors (particularly of heat exchange) on the well-being f domestic animals are discussed. A few problems connected with pastures, shelters, flood

prediction, etc. are summed up. *Subject Headings:* **1. Animal husbandry 2. Climatic effects.**—*G.T.*

ENVIRONMENTAL INFLUENCES

See also: 4.5–1, **Changing the climate to transform nature of arid regions of U.S.S.R.** (Budyko and others); 4.5–12, **Atlantic waters and climate of U. S. S. R.** (Shuleĭkin); 4.5–206, **State and change of forest in Lublin Province, 1830–1930** (Maruszczak).

4.5–217 551.588.6:551.579(438)

Debski, Kazimierz, **Wpływ lasu na stosunki hydrologiczne.** [Influence of forest upon hydrological conditions.] *Poland. Państwowy Instytut Hydrologiczno-Meteorologiczny, Wiadomości Służby Hydrologicznej i Meteorologicznej*, 2(4/5):357–370, **1951.** tables, 22 refs. **DWB**—This article was prepared as part of a series of reviews covering literature on various subjects connected with forestry, agriculture, soil erosion, hydrology and meteorology. Sponsor of the series is the Scientific Council at the Ministry of Agriculture and Agricultural Development of Poland. The author reviews Polish, German, Russian, French and Swiss literature dealing with the effect of forest cover on hydrometeors, evaporation, ground water, runoff and water balance. Data taken from various authors are presented on precipitation, evaporation, absorption and runoff in various types of forest and on river flow as affected by the amount of forests in the catchment. *Subject Headings:* **1. Forest influences 2. Water resources 3. Hydrologic cycle 4. Poland.**—*G.T.*

MISCELLANEOUS APPLICATIONS

SOLAR INFLUENCES

See also: 4.5–89, **Effect of vertical transport of ions caused by solar tides in F2 region** (Choudhury); 4.5–109, **Report of the Commission for the Study of the Relations between Terrestrial and Solar Phenomena;** 4.5–173, **Inadequacy of statistical evidence of lunar influence on atmospheric precip.** (van der Bijl); 4.5–200, **Weather cycles, their causes** (Gillette).

4.5–218 551.590.21/2:632.18

Bhandari, N. N., **Forecasting of natural calamities.** *Irrigation and Power*, Simla, 8(2):292–298, April **1951.** tables. **DWB**—A table containing data of solar and lunar eclipses and sunspot activities in relation to earthquakes and floods for the period 1890–1950 is presented. Author concludes that sunspots do not seem to bear any relation to earthquakes or floods but suggests that floods might be associated with lunar eclipses. He urges a thorough exploitation of the rich astrological material contained in India's ancient literature and also a practical application of modern astronomers' knowledge in trying to give early warning of calamities. *Subject Headings:* **1. Cosmic influences 2. Disasters 3. India.**—*G.T.*

5.4–219 551.590.25:523.5:629

Ovenden, Michael W., **Meteors and space travel.** *British Interplanetary Society, Journal* 10(4):176–180, July **1951.** table, 6 eqs. **DLC**—It is pointed out that meteors of interstellar origin would have a hyperbolic path. Since no such meteors have been found through radar observation so far, it can be assumed that even if they exist, "they cannot account for more than 1% of the visual sporadic meteors." The author also examines data on interstellar dust and concludes that the probability of a space ship's colliding with a dust particle above critical size could be $1/10^{11}$ years. *Subject Headings:* **1. Meteors 2. Interplanetary flights 3. Interstellar dust.**—*G.T.*

VISIBILITY

4.5–220 551.591:551.521.3(52)

Fujiwara, Sakihira, **Kishō kōgaku shimpo no gaikan.** [Review of the progress in meteorological optics.] *Meteorological Society of Japan, Journal, 2nd Ser.*, 28(8):55–68, Aug. **1950.** tables, 24 refs., eqs. In Japanese. **DWB**—Twenty-four papers published in Japan between

940 and 1947 are quoted and discussed. They deal with theoretical and observational spects of solar and sky radiation, atmospheric transmissibility, turbidity, and visibility as ffected by various meteorological factors such as fog and haze, snowfall, smoke, angle of ight incidence, etc. Numerical values obtained in these fields are tabulated. *Subject Headngs:* **1. Radiation 2. Visibility 3. Japan.**—*G.T.*

OPTICAL PHENOMENA

See also: 4.5–247, **Interplanetary material** (Hoffmeister).

4.5–221 551.593.1 551.594.7:621.396.9

*Brocks, Karl, **Die Lichtstrahlkrümmung in den unteren 500m der Atmosphäre. (Tabellen des Refraktions-koeffizienten, II.: Für Höhenmessung und Radiometeorologie).** [The urvature of light rays near the earth's surface. (Tables of the refraction coefficient, II. For height measurements and radiometeorology).] *Annalen der Meteorologie*, 5(1–2):47–57, **952.** 3 figs., 7 tables, 16 refs. German and English summaries p. 47. **DWB**—For Pt. I *ee* 2.1–178, Jan. 1951, *MAB*. Pt. II gives bi-hourly mean values of refraction in central and vest Europe from 0.5–500 m above level plains. These are calculated from mean temperatures gnoring humidity, but the effect of humidity is discussed. Subsidiary tables for June and Dec. give values for clear and overcast days and effect of sun's altitude. Special cases are liscussed. A formula is given for refraction of ultra-short radio waves in terms of pressure, emperature and vapor pressure. *Subject Headings:* **1. Refraction of light 2. Microwave ransmission.**—*C.E.P.B.*

4.5–222 551.593.1:551.521.3

*Güttler, A., **Die Miesche Theorie der Beugung durch dielektrische Kugeln mit absorbierendem Kern und ihre Bedeutung für Probleme der interstellaren Materie und des tmosphärischen Aerosols.** [Mie's theory of refraction by dielectric spheres with absorbing uclei and its importance for problems of interstellar matter and of atmospheric aerosols.] *Annalen der Physik, 6th Ser.*, 11(2–3):65–98, **1952.** 10 figs., 7 tables, 44 refs., 62 eqs. **DWB**—The mathematical theory of G. Mie (*Ann. Physik*, 1908) is set out and the amplitude of the efracted light from small bodies is calculated, including the spherical albedo and asymmetry actor. Pt. 2 gives the numerical evaluation of the theory for small water drops with ice uclei, including extensive tables and plots of the coefficients and extinction factors from 400–700 mμ. Some general conclusions are drawn about the optical peculiarities of turbidity due o aerosols. After investigating the coloring of starlight by interstellar matter, author discusses he opalescent turbidity of the atmosphere, attributing it to the optical difference between bsorbing and dielectric condensation nuclei. The optical characteristics of water drops of 5 mμ diameter with different solid nuclei are calculated. *Subject Headings:* **1. Refraction henomena 2. Aerosols 3. Turbidity.**—*C.E.P.B.*

4.5–223 551.593.5/6:551.521.16(02)(492)

Minnaert, Marcellus (*Prof. Univ. Utrecht*), **Licht en Kleur in het Landschap.** [Light nd color in the open air.] Zutphen, W. J. Thieme, **1949.** 385 p. 177 figs., 16 plates, foot efs. throughout. (His: **De Natuurkunde van 't Vrije Veld,** Pt. I). **DWB**—This is the fourth nd completely revised edition of a fascinating and comprehensive book dealing with all manner of optical phenomena in nature (atmospheric and astronomical), with scores of diarams and photographs illustrating the artistic as well as the physical or optical aspects or principles involved. The problem of light, shadow and color is first discussed on the basis of he refraction or scattering of solar (or star) radiations. Measurement of light intensity or rightness, characteristics of the human eye, color, contrast, effect of form and motion of ubject or object, rainbows, halos, coronas, and other atmospheric optical phenomena, illumination and color of sky, water, or other objects (albedo) and, finally, luminescent plants, animals nd minerals, are given special treatment in separate chapters. *Subject Headings:* **1. Optical henomena 2. Illumination intensity 3. Color visibility 4. Textbooks 5. Dutch language . Netherlands.**—*M.R.*

ELECTRICAL PHENOMENA

See also: 4.5–84, **Conductivity of ionosphere** (Baker, Martyn); 4.5–88, **Theoretical group heights of reflection of 150 Kc/s radio waves vertically incident on the ionosphere** (Davids); 4.5–89, **Determination of vertical distribution of electron density in ionosphere** (Kelso); 4.5–221, **Light ray curvature near earth's surface** (Brocks).

4.5–224 551.594.1

Chalmers, J. Alan, **The relation between point discharge current and field.** *Journal of Atmospheric and Terrestrial Physics*, 2(5):292–300, **1952.** table, 7 refs., 31 eqs. **Point discharge currents.** *Ibid.*, p. 301–305. 8 refs., 7 eqs. **DWB**—WHIPPLE and SCRASE found an empirical relation $I=(A(F^2-M^2)$ between point discharge I and field F; A and M are constants. This is derived theoretically by considering the lines of force and the ionization in inverted cones above an array of points. A is obtained in terms of ion mobility and distance apart and height of the points. A few available data support this expression for A. The second paper discusses the nature of the point discharge below a cloud and shows that it is nearly independent of the nature of the points, e.g., lightning conductors or crests of sea waves. Thus thunderstorms over land and sea probably have similar effects on the earth's negative charge. *Subject Heading:* **1. Point discharges.**—*C.E.P.B.*

4.5–225 551.594.13:551.515

Siksna, R., **Variations of large-ions in atmospheric air during disturbed weather conditions.** *Arkiv för Geofysik*, Stockholm, 1(2–4):237–246, **1951.** 13 figs., 5 refs. Summary p. 246. **MH-BH**—Since disturbed weather conditions are responsible for the appearance of the large ions, the data on the variations were obtained with an Israël large-ion counter during: 1) a snowfall, 2) a dry snowstorm, 3) a cold dense fog and its disappearance, 4) foggy weather caused by the meeting of cold and warm air masses, 5) rainy weather and 6) showers of rain. Correlations between the number of large-ions, their spectra, the number of small ions and the weather conditions can be determined. *Subject Headings:* **1. Ion variations 2. Atmospheric disturbances 3. Ion counters 4. Stockholm, Sweden.**—*W.N.*

4.5–226 537 551.594.21:551.594.25

Gill, E. W. B. and Alfrey, G. F., **The electrification of liquid drops.** *Physical Society of London, Proceedings, Ser. B*, 65:(394):546–551, **1952.** 2 figs. **DWB**—Describes experiments to show electrical charges on drops due to: 1) drops or spray falling through an electrified cylinder and 2) breaking of drops by air blast giving a considerable + charge on target onto which spray was blown, caused by rebounding of drops from target; charge was greatest when distilled water was used. ZELENY's experiment (1933) is discussed. When spray was blown on ice, ice acquired a + and rebounding drops a − charge. *Subject Headings:* **1. Electricity of precipitation 2. Thunderstorm electricity.**—*C.E.P.B.*

4.5–227 551.594.22:550.37

*Fritsch, Volker, **Geoelektrische Untersuchungen zur Ermittlung der Blitzgefährdung.** [Geoelectric investigations for the determination of lightning danger.] *Geofisica Pura e Applicata*, 22(3/4):237–250, April/June **1952.** 4 figs., 25 refs. German and English summaries p. 237. **MH-BH**—Experiments carried out by the author in Austria show the following results: 1. The electrical conductivity of the ground has a decisive influence on the source of the lightning discharge near the earth. 2. Therefore some areas are frequently struck by lightning: such zones are called "lightning nests." 3. The amplitude of the strength of the lightning current is determined also by the specific resistivity of ground. 4. The agreement between the position of lightning nests and the geoelectric condition of ground is beyond dispute. *Subject Headings:* **1. Lightning 2. Electrical conductivity of soil 3. Terrestrial electricity 4. Austria.** *Author's abstract.*

4.5–228 551.594.22

Utsu, T., **On corona discharges from pointed bodies caused by volume charge.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(9):319–323, Sept. **1951.** 10 figs. In Japanese,

English summary p. 323. **MH-BH**—A volume charge was produced by spraying water drops from a nozzle placed between two charged plates, and the discharge current to a point was measured. Polarity found in the corona is attributed to different mobility of electrons and positive ions in a strong electric field. *Subject Heading:* **1. Electrical discharges.**—*C.E.P.B.*

4.5–229 551.594.221:537.5

Jones, F. Llewellyn and Parker, A. B., **Electrical breakdown of gases. I. Spark mechanism in air.** *Royal Society of London, Proceedings, Ser. A*, 213(1113):185–202, June 24, **1952.** 4 figs., 15 refs. Dutton, J., Haydon, S. C., and Jones, F. Llewellyn, **II. Spark mechanism in nitrogen.** *Ibid.*, p. 203–214. 5 figs., table, 7 refs. **DWB**—Describes experiments on growth of small ionization currents in pre-breakdown between parallel plates, about 1 cm apart, first in air and later in nitrogen. The growth of the currents was exponential over most of the sparking distance, but near breakdown a faster double exponential became dominant. An expression is given for calculating breakdown potential in terms of gas pressure and electrode separation. *Subject Headings:* **1. Disruptive discharges. I. Dutton, J. II. Haydon, S. C.**—*C.E.P.B.*

4.5–230 551.594.221:629.13

Newman, M. M., **Aircraft phases with respect to lightning protection.** (In: **Thunderstorm electricity.** Chicago. University. Dept. of Meteorology, Oct. **1950.** p. 301–317. 17 figs.) **DWB**—The author describes briefly the flight research program for investigating the probabilities of protecting all metal aircraft against lightning and gives an illustration of a "scope" developed for making oscillographic records of electric discharges between clouds by airplanes in flight and a diagram of an aircraft antenna protection assembly. A summary of the atmospheric conditions under which lightning is encountered by aircraft, of the degree of lightning protection required, etc. is presented. *Subject Headings:* **1. Lightning protection 2. Aeronautical meteorology.**—*I.L.D.*

4.5–231 551.594.25:551.515.41

Chalmers, J. Alan, **Electric charges from ice friction.** *Journal of Atmospheric and Terrestrial Physics*, 2(6):337–339, **1952.** 10 refs. **DWB** -Icy snow was rubbed together so that fragments fell into a collector, and in every case a negative charge around 10^{-11} coulombs/g arrived at the collector. This may bear on the origin of thunderstorm electricity. *Subject Headings:* **1. Electricity of precipitation 2. Thunderstorm electricity.**—*C.E.P.B.*

4.5–232 551.594.25:551.574.1:551.515.41

Shishkin, N. S., **O zariade kapel' v grozovykh oblakakh.** [On the charge of drops in thunderclouds.] *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, Informatsionnyĭ Sbornik*, 1:47–54, **1951.** 5 figs., 8 refs., 17 eqs. **DLC**—Calculation of the coagulation charge of drops in a polydisperse cloud with an ascending stream. The primary stage in drop growth is attributed to water vapor condensation. The development is very quick at the outset and slows down with increasing drop size. After reaching a size near 20μ the further growth is much affected by coagulation. The calculations made by the author show the most rapid growth of the drop charge in the layer 600–1200 m above the base of the cloud, when the speed of the ascending stream is 1 m/sec. Charges of the order of 10^{-1} CGSE are obtained at the height of 2.5–3.5 km over the cloud base (3.4–4.5 km above the ground surface). While falling from this height to 1 km above the cloud base, the charge of the sizable drops and the speed of growth increase rapidly and therefore the author considers this layer as the most probable area of the origin of thunderstorm electrical phenomena. The freezing of drops does not essentially change the results. A brief summary of measurements made from airplane by Ross Gunn. (*Physical Review*, 71:181, 1947) concludes the paper. *Subject Headings:* **1. Drop charge 2. Thunderclouds 3. Drop growth 4. Thunderstorm electricity. I. Gunn, Ross.**—*N.T.Z.*

AURORAS

4.5–233 551.594.5:621.396

Bowles, K., **The fading rate of ionospheric reflections from the aurora borealis at 50 mc/sec.** *Journal of Geophysical Research*, 57(2):191–196, June **1952.** 3 figs., 2 refs. **MH-BH** —Amateur radio operators communicate from time to time by a phenomenon of anomalous ionospheric propagation associated with the aurora borealis. Measurements have been made of the rapid flutter-type of fading associated with this kind of propagation at 50 Mc/sec. The power-spectrum of the fading seems to have frequency-components of roughly equal strength from zero frequency to a cut-off frequency between 100 and 200 cycles/sec. The fading frequency is thus about a power of ten greater than might be anticipated from usual ionospheric velocities. In most cases, both transmitting and receiving antennas must be of the same polarization and must be pointed more or less in the direction of the visible aurora. Amplitude modulated speech-transmission is occasionally possible at 50 Mc/sec by means of this type of propagation. *Subject Headings:* **1. Radio transmission 2. Auroras.**—*Author's abstract.*

4.5–234 551.594.51:551.521.63:535.33

Saskatchewan. University. Physics Dept., **The intensities of ultraviolet features of the auroral spectrum.** Contract AF19(122)-152, Scientific Report No. AR-5, Aug. **1951.** 14 p. tables, photo. **DWB**—Twenty-eight ultraviolet spectra of the aurora have been obtained and 15 analyzed with a microphotometer and intensitometer. The intensities have been corrected for the effects of Rayleigh scattering and ozone absorption, and show that they yield vibrational temperatures less than 500°K. Data are given in tables and an example of a polar aurora ultraviolet spectrum reproduced. *Subject Headings:* **1. Auroral spectra 2. Ultraviolet intensities 3. Ultraviolet spectrum. I. Petrie, William II. Small, R. III. Contract AF19(122)-152.**—*From authors' abstract.*

4.5–235 551.594.51

Petrie, W. (*Physics Dept. Univ. of Saskatchewan, Canada*), **Rotational temperatures of Vegard-Kaplan auroral bands.** *Physical Review*, 86(5):790–791, June 1, **1952.** 3 refs. **DWB** —The mean temperature derived from the positions of branch maxima of five $^1\epsilon g^+ - {}^3\epsilon\mu^+ N_2$ bands in the wave length range λλ3400–3800 was found to be 850°K, using photographs of spectra of several intense auroral displays. These results are more in conformity with estimates of particle density at about 200 km than VEGARD's values of about 350°K derived from N_2^+ band spectra. *Subject Headings:* **1. Auroral spectra 2. Upper air temperatures.**

RADIO METEOROLOGY

4.5–236 551.594.7:621.396

Bailey, D. K., Bateman, R., Berkner, L. V. (*Washington, D. C.*) and others, **A new kind of radio propagation at very high frequencies observable over long distances.** U. S. National Bureau of Standards, Project NBS, 1405-21-6805, NBS Report 1172, Sept. 28, **1951.** 10 p. 5 figs., 8 eqs. **DWB**—Experiments on the propagation of radio waves with a frequency of 49.8 Mc/sec over a distance of 1245 km are reported. "Some preliminary speculations suggest that the mechanism of this type of propagation may be scattering due to ever-present turbulence in the E region, and an approximate transmission equation is derived in terms of parameters describing inhomogeneities in the E region." The influence of passing meteors is discussed. Hourly signal intensities are graphically represented and records showing enhancement and fadeout reproduced. *Subject Heading:* **1. Radio wave propagation. I. Project NBS, 1405-21-6805 II. U. S. National Bureau of Standards.**—*G.T.*

4.5–237 551.594.7

Booker, Henry George (*Cornell Univ.*), **Application of the magneto-ionic theory to radio waves incident obliquely upon a horizontally-stratified ionosphere.** *U. S. Air Force Cambridge Research Laboratories, Geophysical Research Papers*, No. 7:18–55, Dec. **1950.** 14 figs., 10 refs., 107 eqs. **DWB**—An algebraic quartic equation for the vertical component q of the phase propagation vector can be used for the solution of the problem. The roots of q are plotted as

a function of the electron-density N for fixed values of the wave frequency, direction of earth's magnetic field and direction of incidence upon the ionosphere. A simplified cubic equation is used for computing limiting curves. Formulas for attenuation, lateral deviation, horizontal range and equivalent paths of magneto-ionically split wave-packets are derived. *Subject Headings:* **1. Radio wave propagation 2. Ionosphere 3. Magneto-ionic theory.**—*A.A.*

4.5–238 551.594.7:621.396

Hay, H. G. and Unwin, R. S., **Tropospheric wave propagation in a duct of non-uniform height.** *Physical Society of London, Proceedings, Ser. B*, 65(12):981–989, Dec. 1, **1952.** 3 figs. 4 refs., 26 eqs. **DWB** –The simple mode theory of tropospheric refraction (H. G. BOOKER and W. WALKINSHAW, 1947) is extended to cover situations where refractive index profile varies, e.g., with distance offshore. The expression (22) for field strength in decibel form is applied to experimental data on radio ducts off New Zealand, duct width increasing from 100 ft near coast to 350 ft at 55 km, and gave values of field strength of the right order at long ranges. A more general expression for field strength is also given (16). *Subject Headings:* **1. Radio transmission ducts 2. New Zealand.**—*C.E.P.B.*

4.5–239 551.594.7

Hines, C. O., **Wave packets, the Poynting vector, and energy flow: Part I—Non-dissipative (anisotropic) homogenous media; Part II—Group propagation through dissipative isotropic media; Part III—Packet propagation through dissipative anisotropic media.** *Journal of Geophysical Research*, 56(1, 2):63-72; 197–207; 207-220, March, June **1951.** 15 refs., 131 eqs. **MH-BH, DWB**—An attempt to correlate the results of electromagnetic propagation energy velocities obtained by the wave packet and the Poynting vector by the energy density does not equal the speed obtained by the packet method. The first paper deals with nondissipative method in which the effective permittivity matrix is Hermitian. When plane homogenous waves are propagated through a homogenous, nonabsorbing medium, agreement is good for direction in which energy flows. In the second paper, the expression for velocity of a wave packet or group speed in dissipative isotropic medium was found to be $U=c/(dkn_1/dk)$ where n_1 is the real part of the refractive index at frequency $kc/2\pi$. Expressions are also obtained which apply to transmission of pulses through slabs of material. In the third paper formulas are proposed for expressing the velocity of a packet in an anisotropic dissipative medium. One expression is given for homogenous waves and one for inhomogenous waves. In the case of nondissipative media, the two are shown to be equal. *Subject Headings:* **1. Electromagnetic wave propagation 2. Radio wave propagation.**—*M.R.*

4.5–240 551.594.7:06 551.577.1:621.396.9

Jones, R. F., **Application of radar to meteorology. Conference in Montreal.** *Nature*, London, 170(4337):1004–1005, Dec. 13, **1952.** **DWB**—Account of conference at McGill University Sept. 15–17, 1952. Sec. A, "Precipitation mechanisms," included coalescence of liquid drops especially by turbulence, turbulence affecting aircraft, and snow generation; Sec. B described "Cloud observations and cloud radar problems"; Sec. C, the use of airborne radar to increase passenger safety and comfort; Sec. D included two papers on "Rain measurements" by radar; Sec. E, "Instruments" for raindrop size and distribution and Sec. F "Scattering in the atmosphere" (including "angels"). The final session discussed "Fluctuating signals" and their bearing on turbulence. *Subject Headings:* **1. Radar meteorology 2. Rain formation 3. Conferences.**—*C.E.P.B.*

4.5–241 551.594.7:621.396.11

*Phillips, W. Eric, Ashwell, P. C. and Browne, L. C. (*Univ. of Natal, Durban*), **Atmospheric super-refraction and the anomalous propagation of radio waves off the coast of Natal.** *South African Journal of Science*, 48(5):163–166, Sec. **1951.** 2 figs., 7 refs. **DWB**—Correlated meteorological observations with microwave phenomena on the Natal coast of Wentworth and Durban, showed that super-refraction is present during the autumn and winter months. Some ducts were transitory. The K-H layer plays no role in such propagation. Some data are given. *Subject Headings:* **1. Atmospheric refraction 2. Microwave propagation 3. Radio wave propagation 4. Natal, South Africa.**—*W.N.*

ACOUSTICAL PHENOMENA

4.5–242 551.596.1:551.571.3

Gopalji, ——, **Ultrasonic absorption of normal air at 456 Kc/s for different humidities.** *Indian Journal of Physics*, 25(6):298–304, June **1951.** 7 figs., table, 6 refs., 15 eqs. **DLC**—The simplified treatment of the ultrasonic formula $\mu = \frac{2.303[\log_{10}\Delta\theta_A - \log_{10}\Delta\theta_B]}{n_B - n_A}$ is demonstrated (at 455.8 Kc/s) in the case of a mixture of nitrogen, oxygen and carbon dioxide in normal air proportions with varying water content. *Subject Headings:* **1. Ultrasonics 2. Humidity variations.**—*W.N.*

ASTROPHYSICS

4.5–243 523.3

†Markov, A. V., **Obrazovanie rel'efa i fiizicheskie svoĭstva lunnoĭ poverkhnosti.** [Formation of the relief and physical properties of the surface of the moon.] *Priroda*, Moscow, No. 9:12–20, Sept. **1951.** 7 figs., 27 refs. **MH-BH**—A major popular article, giving many details of the present day knowledge of the morphology, physiography, soil or rock formations, radiative characteristics (albedo), climate, etc. of the moon. *Subject Headings:* **1. Albedo of moon 2. Lunar atmosphere 3. Planetary atmospheres.**—*M.R.*

4.5–244 523.3

Moore, Patrick A., **What we know about the moon.** *British Interplanetary Society, Journal*, 11(1):19–40, Jan. **1952.** photos. **DLC**—Present knowledge concerning the moon, its surface, indications of its eventual atmosphere, possibility of life, the side averted from the earth, etc. is summed up. A photograph showing the eastern half of the moon and drawings of details on the planet's surface are presented. In discussing the possible existence of a lunar atmosphere, the author points out that most of the atmosphere which probably existed on the moon at an earlier stage of development "has now leaked away into space." A very tenuous atmosphere, however, possibly still exists, as seems to be indicated by lunar "twilight" (which it is difficult to distinguish from "earthshine"), by occultation of planets, by grey borders to black shadows in craters and by meteor flashes recently reported. The author further points out that the existence of lunar mists is established beyond doubt but that water is certainly lacking on the moon. *Subject Headings:* **1. Moon 2. Lunar atmosphere 3. Planetary atmospheres.**—*G.T.*

4.5–245 523.32

Möller, F., **Die Temperatur der Mondoberfläche.** [The temperature of the moon's surface.] *Zeitschrift für Meteorologie*, 5(5/6):185–189, May/June **1951.** fig., 8 refs., 5 eqs. **MH-BH**—Discussion of radiation balance of the moon on basis of astronomically observed temperatures of +134 to −154°C. Equilibrium is not reached during moon's night so that heat conductivity of the ground must be lower than that of dry quartz sand. (*See also* article by Lettall, *item* 2.8-76, Aug. 1951, *MAB.*) *Subject Heading:* **1. Lunar temperature.**—*C.E.P.B.*

4.5–246 523.5

Chapman, Sidney (*Queen's Col., Oxford*), **Meteors and meteorites.** *Washington Academy of Sciences, Wash., D. C., Journal*, 42(9):273–282, Sept. **1952.** refs. **DWB**—In a smoothly-worded, non-technical lecture the author gives a general insight into the physics of interstellar matter entering the earth's atmosphere, discussing subjects like number, height and speed of meteors; their observation by visual methods and radar; meteor showers and supershowers, meteor spectra, meteoric ionization of the atmosphere; investigation of the upper atmosphere by means of meteor observation, meteorite falls; the composition, structure and radioactivity of meteorites and light and sound phenomena connected with their passage through the atmosphere; historical meteorite falls, etc. *Subject Headings:* **1. Meteors 2. Meteorites.**—*G.T.*

4.5–247 523.5 551.593.653

Hoffmeister, C., **Interplanetare Materie.** [Interplanetary matter.] *Naturwissenschaften*, 38(10):227–234, May 11, 1951. 3 figs., table, 34 refs. **DWB**—Author summarizes information about asteroids, comets, meteorites and zodiacal light (attributed to reflection of sunlight from an interplanetary dust cloud). Then describes and illustrates lightstreaks caused by fine dust (less than 0.1 mm diameter) in 90–180 km height. The streaks are due to wave motion. Finally, cirrus-like luminous night clouds are partly due to cosmic dust (diameter 10^{-6} cm). Also refers to solar corona. The distribution of all this matter is brought together in a schematic diagram, and the density of matter in interplanetary space is discussed. *Subject Headings:* **1. Interplanetary matter 2. Luminescent clouds.**—*C.E.P.B.*

4.5–248 523.7 551.590.21

Behr, A. and Siedentopf, H., **Sonnenüberwachung.** [Sun observation.] *Naturwissenschaften*, 39(2):28–38, Jan. **1952.** 13 figs., 3 tables, 20 refs. **DWB**—The various sources and types of radiation from the sun, and their terrestrial effects are summarized in a diagram. Types, distribution and variations of sunspots are described, then faculae, eruptions, protuberances and filaments. Observations of the sun's corona are described in detail, then the highly variable non-thermal radio emissions of centimeter and meter waves. Examples of "synoptic" charts show sunspot groups, faculae, filaments, eruptions and isophotes of the "green" corona. A list of publications of regular solar data concludes this useful summary. *Subject Headings:* **1. Solar activity 2. Solar faculae 3. Sun's corona 4. Sunspots.**—*C.E.P.B.*

4.5–249 523.78

Houtgast, J., **De zonsverduistering van 25 Februari 1952.** [The solar eclipse of 25 February 1952.] *Hemel en Dampkring*, 50(3):41–47, **1952.** 7 figs. **DLC**—A popular account of the preparation for and photographing of the eclipse in Khartoum. Photographs of the members of the Dutch expedition, of the solar corona during complete eclipse, of the spectrum of a protuberance and of spectra of the chromosphere are reproduced. *Subject Headings:* **1. Solar eclipses 2. Sun's corona 3. Solar spectrum 4. Khartoum, Sudan.** —*I.L.D.*

4.5–250 523.78

Sen, S. N., **Total solar eclipse of February, 1952.** *Science and Culture*, Calcutta, 18(1):22–25, July **1952.** 4 figs., map. **DWB**—Brief report on observation of the solar eclipse in Feb. 1952 conducted at Khartoum, Sudan, by about 60 scientists belonging to 17 separate expeditions from Europe and the U. S. Results obtained in solar radio noise and chromospheric temperature measurement, in studying the corona and in geodetical observation are summed up. Photographs showing equipment used by U. S. scientists are reproduced from various American journals. Achievements of French amateur astronomers are mentioned. *Subject Headings:* **1. Solar eclipses 2. Khartoum, Sudan.**—*G.T.*

4.5–251 523.78

von Klüber, H., **Beobachtungen der Sonnenfinsternis vom 25. February 1952 im Sudan.** [Observations of the solar eclipse of Feb. 25, 1952 in the Sudan.] *Naturwissenschaften*, 39(9):199–206, May 1, **1952.** 9 figs., 10 refs. **DWB**—A brief introduction describes the physics of the sun and its relation to the ionosphere, and radio astronomy. The work of the 16 expeditions (including 4 from U.S.) in or near Khartoum on these is then summarized. *Subject Headings:* **1. Solar eclipses 2. Khartoum, Sudan.**—*C.E.P.B.*

4.5–252 523.78

Waldmeier, Max, **Die totale Sonnenfinsternis vom 25. Februar 1952.** [The total eclipse of Feb. 25, 1952.] *Naturwissenschaftliche Rundschau*, 5(6):221–225, June **1952.** 6 figs. **DWB**—Brief account of Swiss expedition to Khartoum, mainly on sun's corona. *Subject Headings:* **1. Solar eclipses 2. Sun's corona 3. Khartoum, Sudan.**—*C.E.P.B.*

4.5–253 523.8:621.396

Brown, Hanbury R. and Hazard, C., **Extra-galactic radio-frequency radiation.** *Philosophical Magazine*, London, 43(337):137–152, Feb., **1952.** 4 figs., 4 tables, refs. **DWB**—The paper describes a survey of radio emission down to 1.89 m from four bright nebulae. The results are used to predict radio intensity from major clusters of nebulae, the predictions being checked on two clusters. Finally, irregularities in the radioisophotes are checked against large-scale irregularities in distribution of extra-galactic nebulae; it is found that apparent photographic magnitude increases more rapidly than apparent radio magnitude. *Subject Headings:* **1. Radio frequency radiation.**—*C.E.P.B.*

4.5–254 525.5:518.3

Strassl, Hans, **Ein Nomogramm für die Dauer von Polartag und Polarnacht bei beliebiger Ekliptikschiefe.** [A nomogram for the duration of the polar day and polar night for any given obliquity of the ecliptic.] *Polarforschung*, 3(1):40–43, **1951.** fig., table. **DLC**—Allowing 51′ for sun's radius and refraction, nomogram gives lengths of northern and southern polar day and night for any latitude. Designed for problems of geological climates. *Subject Headings:* **1. Nomograms 2. Daylight duration.**—*C.E.P.B.*

PART II. SELECTIVE ANNOTATED BIBLIOGRAPHY ON HIGH LEVEL WINDS (500–100 MB)

By: *Gwynne J. Evans*

(Meteorological Office Library, Harrow, England)

EXPLANATORY NOTE

A survey of literature and published sources of data on winds at high flying levels (16,000 to 60,000 ft) cr in the stratosphere brought to light nearly a thousand items from all parts of the world. Rigid selection and combination of items where the same data has been included in a later summary reduced this number to about 600, which have been divided arbitrarily into 3 groups as follows: 1) 500 to 100 mb, 2) jet stream and 3) stratosphere above 100 mb and ionosphere. In cases where one reference treats of winds in two or all of the categories, it has been our practice to place it according to the highest level mentioned. Some overlapping is, of course, unavoidable.

The Subject Outline below will serve as a guide to the observational and computational methods used, the structure and theory of high level winds, specific characteristics and distribution of winds, and applications of high level wind information. The Geographical Outline indicates the world-wide scope of the material selected for inclusion in this bibliography.

The asterisk (*) is used to denote a source of data, the dagger (†) a good source of references and the Symbol (§) a synoptic study.

Selective annotated bibliographies on "**Stratospheric and ionospheric winds**" and on the "**Jet stream**" will appear in the June and July 1953 issues, respectively, of *Meteorological Abstracts and Bibliography*.

For references to wind structure at high levels, see items 4B–19, 4B–54, and 4B–104 in bibliography on "**Turbulent diffusion,**" Feb. 1953, *MAB;* for other references *see also* 3–52; 2.1–21, 4.2–118. For material on High Level Turbulence, see Nov. 1952, *MAB*, as referred to in item 4E–242.

SUBJECT OUTLINE

Observational and Computational Methods

Pilot balloons, 4E–1, –4 to –9, –11, –12, –14, –16, –17, –19, –23, –24, –29, –30, –33, –34, –36 to –38, –40 to –42, –45, –47, –49 to –51, –53, –55, –57, –58, –67, –69, –73, –75, –78 to –80, –82, –85, –91 to –95, –103, –115, –118, –121, –124, –126 to –130, –141, –145, –148, –152, –155, –162, –165, –170, –173, –190, –195, –196, –200, –210, –211, –217, –228, –235

Constant level balloons, sounding balloons and other balloons, 4E–93, –188, –197, –260

Electronic equipment

Radar, rawins and rawinsondes, 4E–69, –143, –153, –167 to –169, –173, –178, –179, –195, –223, –236, –237, –239, –247, –249, –263, –271

Radiosondes, 4E–127, –143, –145, –147, –166, –167, –178 to –180, –189, –196, –201, –211, –218, –227, –233, –235, –237 to –239, –249, –251, –264

Kites and gliders, 4E–1, –80

Pilot reports, 4E–93, –142, –162, –182, –193, –203, –210

Cloud movement

Tropospheric clouds, 4E–12, –29, –32, –42, –67, –126, –170

Smoke and dust drift, 4E–156, –225, –231

Noctilucent clouds and ionospheric drift (Large number of papers to appear in bibliography on Winds above 100 mb, *MAB*, 4(6) June, 1953)

Pressure distribution, 4E–32, –118, –138, –183, –186, –215, –236

Statistical, 4E–128, –183, –200, –249

Theoretical Studies

Origin, 4E–149, –205

Wind variation with height, 4E–4, –5, –15, –44, –47, –60, –100, –102, –104, –112, –119, –122, –126, –151, –156, –174, –181, –193, –207, –223, –224, –227, –240, –243, –251

Relation to general circulation and pressure distribution, 4E–18, –32, –34, –42 to –44, –47, –48, –56, –60, –70, –76, –84, –88, –106, –111, –116, –117, –119, –127, –146, –147, –149, –158, –162, –164, –172, –184, –194, –198, –199, –203, –205, –209, –219, –220,

–224, –225, –230, –241, –243, –248, –250, –251, –253
Relation to tropopause and jet stream, 4E–122, –149, –172, –174, –193, –194, –227, –231, –237, –250, –253 (Large number of papers to appear in bibliography on Jet stream, *MAB*, 4(7), July 1953)
Geostrophic winds, 4E–87, –136, –183
Gradient winds, 4E–5, –18, –164, –248
High Level Wind Data
Speed, 4E–3, –5 to –12, –14 to –18, –21 to –23, –27, –28, –31, –33, –35 to –41, –43 to –45, –48 to –58, –62 to –65, –67 to –69, –71, –72, –74 to –76, –78 to –81, –83, –85, –86, –89, –91, –92, –94 to –97, –100 to –102, –106 to –109, –112, –113, –115, –120, –121, –123 to –128, –130, –131, –133 to –136, –138, –140, –141, –143, –145, –148, –150, –152, –152, –155, –157, –159, –160, –162, –163, –166, –171, –172, –174 to –178, –185, –189 to –192, –196, –201, –202, –210 to –212, –216, –218, –221 to –223, –232, –235, –238, –239, –243 to –245, –250, –251, –259, –272
Direction, 4E–5 to –17, –21, –22, –27 to –31, –34 to –41, –43 to –50, –52 to –59, –62 to –69, –71, –72, –74, –76, –80 to –83, –85, –89, –91, –92, –95 to –99, –106 to –109, –112, –114, –115, –120, –121, –123 to –128, –130, –131, –133 to –135, –140, –141, –143, –144, –147, –148, –152, –153, –155, –157, –159, –160, –162, –163, –171, –172, –176 to –179, –185, –188 to –191, –201, –202, –210, –211, –215, –216, –218, –221 to –223, –232, –235, –238, –244, –245, –251
Frequency and variability, 4E–1 to –3, –9, –15, –16, –20, –22 to –24, –26, –27, –29 to –31, –35, –37, –40, –46, –50, –53, –62 to –64, –72 to –75, –77, –82, –89 to –91, –94, –96, –99, –102, –106, –111, –113, –120, –121, –124, –125, –131, –133, –134, –139, –140, –142, –144, –146, –147, –151, –155, –157, –160, –161, –163, –166, –168, –171, –172, –174, –176, –179, –180, –187, –189, –190 to –192, –196, –202, –204, –206, –213, –216, –221, –222, –226, –232, –237, –238, –244, –246, –247, –251, –261, –265, –267
Seasonal distribution, 4E–10, –25, –50, –53, –61, –66, –70, –72, –73, –86, –88, –90, –94, –96, –100, –101, –110, –119, –121, –123, –163, –166, –170, –171, –175 to –177, –191, –194, –196, –212, –215, –217, –218, –234, –239
Upper air wind charts, 4E–36, –98, –112, –116, –118, –119, –136, –144, –150, –154, –178, –220, –227, –234, –249
Climatological studies, 4E–13, –19, –21, –83, –90, –132, –187, –211, –261
Upper air wind roses, 4E–66, –73, –82, –86, –90, –94, –99, –110, –112, –129, –133, –137, –139, –151, –153, –161, –163, –170, –176, –177, –206, –208, –212, –213, –217, –226, –251
Resultant winds, 4E–14, –24, –25, –33, –37, –40, –50, –53, –54, –110, –121, –126, –131, –133, –134, –139, –141, –151, –162, –163, –171, –183, –217, –231, –247, –249
Stratospheric winds and ionospheric winds (Large number of papers to appear in bibliography on Winds above 100 mb *MAB*, 4(6), June 1953)
Forecasts and Applications
Aviation and jet transport, 4E–25, –104, –131 to –134, –138, –141, –151, –154, –163, –171, –175, –176, –186, –191 to –193, –207, –209, –214, –216, –227, –229, –234, –241, –269
Turbulence, 4E–182, –242
Navigation, 4E–105, –252
Forecasting, 4E–158, –214, –236, –249

GEOGRAPHICAL OUTLINE

NORTHERN HEMISPHERE, 4E–150
NORTH AMERICA, 4E–127, –179, –201
Alaska, 4E–133
Canada, 4E–154, –172
Eastern Canada, 4E–182
Eureka, 4E–221
Northern Canada, 4E–115
Northwest Territories, 4E–91
Resolute, 4E–222
Toronto, 4E–255
Central America, 4E–163, –179
Greenland, 4E–49, –79, –108, –189
Etah, 4E–110
Thule, 4E–202
Iceland, 4E–53, –79
Mexico, 4E–144, –176, –201
United States, 4E–25, –43, –86, –117, –258
District of Columbia, 4E–177
Massachusetts
Blue Hill, 4E–3
SOUTH AMERICA, 4E–112
Chile, 4E–124
Santiago, 4E–113
Colombia, 4E–219
Peru, 4E–148
EUROPE
Austria
Vienna, 4E–155, 4E–259
Belgium, 4E–165
Uccle, 4E–128
British Isles, 4E–194, –230
England, 4E–122, –181
Larkhill, 4E–237
English Channel, 4E–218
Bulgaria, 4E–57
Central Europe, 4E–18
Denmark, 4E–228
Finland, 4E–145, –233
Ilmala, 4E–26

France, 4E–174, –190
Marseilles, 4E–171
Germany, 4E–2, –101, –153, –235
Berlin, 4E–62, –63, –72, –240
Hamburg, 4E–44
Husum, 4E–265
Lindenberg, 4E–260
Rhine Palatinate, 4E–164
Western Germany, 4E–118, –166
Wiesbaden, 4E–238
Hungary
Debrecen, 4E–68
Lithuania
Vilna, 4E–95
Netherlands, 4E–78, –159
Poland, 4E–93
Portugal
Coimbra, 4E–217
Spain
Barcelona, 4E–59, –135
Gibraltar, 4E–250
Sweden, 4E–64, –254
Abisko, 4E–6, –7, –9
U.S.S.R., 4E–45
Kiev, 4E–259
Leningrad, 4E–30
Northwest Russia, 4E–16
Pavlovsk, 4E–17, –31
Siberia, 4E–146
AFRICA, 4E–119
Algiers, 4E–51, –114, –180
Belgian Congo, 4E–208
British East Africa, 4E–140
British Somaliland
Berbera, 4E–66
Egypt, 4E–8, –22, –89
Cairo, 4E–40, –191
French Equatorial Africa
Fort Lamy, 4E–100
French West Africa, 4E–120
Italian Somaliland
Mogadiscio, 4E–65, –184, –185
Libya
Cirenaica, 4E–147
Madagascar, 4E–70, –160, –161
North Africa, 4E–224
Rhodesia, 4E–200
Southern Rhodesia, 4E–39, –267
Salisbury, 4E–162
Ruandi Urundi, 4E–208
South Africa, 4E–24, –35, –74, –75, –200
Southwest Africa
Luanda, 4E–92
Sudan, 4E–22
Khartoum, 4E–40
Wadi Halfa, 4E–83
Tripoli, 4E–216
Tunisia, 4E–21
West Africa, 4E–84
ASIA
Ceylon
Colombo, 4E–82
China, 4E–42, –96, –97
Dairen, 4E–195
Hong Kong, 4E–69, –239, –251
Nanking, 4E–81
Szechuan, 4E–123
India, 4E–14, –29, –77, –111, –256, –266
Agra, 4E–36
Poona, 4E–223
Indochina, 4E–76, –157, –187
Cochin, 4E–61
Iran
Bahrein Islands, 4E–245
Northwest Iran, 4E–141
Iraq, 4E–89, –125
Hinaidi (Baghdad), 4E–125
Mosul, 4E–125
Rutbash, 4E–125
Shaibash, 4E–125
Japan, 4E–56, –173
Honjo, 4E–272
Mt. Fuji Observatory, 4E–205
Naha, 4E–136
Tateno, 4E–268
Khuzistan, 4E–141
Lebanon, 4E–216
Mongolia, 4E–33
Palestine, 4E–8, –10, –89
Southwest Asia, 4E–224
Trans-Jordan, 4E–89
U.S.S.R.
Ashkhabad, 4E–34
Siberia, 4E–146
Sverdlovsk, 4E–80
Vladivostok, 4E–47
Yakutia, 4E–38
AUSTRALASIA
Australia, 4E–206
Sydney, 4E–58
New Zealand, 4E–102, –215
Auckland, 4E–247
Wellington, 4E–73
OCEAN, SEAS AND ISLANDS
Atlantic Ocean, 4E–1, –5, –15, –20, –46, –52
Azores, 4E–103
Canary Islands
Tenerife, 4E–170
Falkland Islands
Port Stanley, 4E–212
North Atlantic, 4E–137, –183
South Atlantic, 4E–243
Caribbean Area, 4E–60, –126, –151
West Indies, 4E–257
Jamaica
Kingston, 4E–94
Puerto Rico
San Juan, 4E–50
Trinidad
Piarco, 4E–152
Indian Ocean, 4E–132, –142, –213
Cocos Island, 4E–142
Heard Island, 4E–211
South Indian Ocean, 4E–28
Mediterranean Area, 4E–230
Balearic Islands
Minorca, 4E–129, –261

Cyprus, 4E–98
Malta, 4E–89, –171, –191
Pacific Ocean, 4E–226
Caroline Islands, 4E–133
China Sea, 4E–90
Coral Sea
Willis Island, 4E–19
East Pacific, 4E–138
East South Pacific, 4E–5
Fiji Island
Nandi, 4E–196
French Oceania, 4E–76, –99
Tahiti, 4E–106
Guam, 4E–27
Hawaiian Islands, 4E–134
Macquarie Island, 4E–211
Marshall Islands, 4E–133
Eniwetok, 4E–168
Netherlands Indies, 4E–13
Batavia, 4E–11
North Pacific, 4E–137
Philippine Islands, 4E–116
Ryukyu Islands, 4E–136
Samoa, 4E–23
Apia, 4E–37, –204
South Pacific, 4E–132, –234
South Pacific Islands, 4E–134
Tasman Sea, 4E–104
West Pacific, 4E–90
Antarctica, 4E–54, –107, –121, –211, –262
Little America, 4E–262
Arctic, 4E–41, –85, –203, –252
North Pole, 4E–203

SELECTIVE BIBLIOGRAPHY ON HIGH LEVEL WINDS (500–100 mb)

By: *Gwynne J. Evans*

1909

4E–1 551.506.5(261

Teisserenc de Bort, Léon Philippe, and Rotch, A. L., **Étude de l'atmosphère marine par sondages aériens atlantique moyen et région intertropicale.** [Study of the atmosphere over the sea by aerial soundings over the central Atlantic and the intertropical regions.] *Trappes, France. Observatoire de Météorologie Dynamique, Travaux Scientifiques,* No. 4, **1909.** 241 p., 17 plates. **GB-MO**—The results obtained by pilot balloon and kite ascents made by staff from Blue Hill and Trappes observatories during expeditions to Madeira, the Canaries, the Azores and later Tenerife, Ascension Island etc., presented and discussed. Results of ascents made in 1905, 1906 and 1907 given in detail. Trade and anti-trade winds, and variations of latter with latitude, discussed. *Subject Headings:* **1. Expeditions 2. Trade winds 3. Upper air soundings 4. Atlantic Ocean.**—*G.J.E.*

1910

4E–2 551.557.36(431/5

Assmann, R., **Die Winde in Deutschland.** [The winds in Germany.] Braunschweig, Vieweg und Sohn, **1910.** 61 p. 13 charts, 12 tables.—Excellent early analysis of surface and upper winds. Winds at 4 km and above grouped together for analysis. *Subject Headings:* **1. Upper air winds frequencies 2. Germany.**—*G.J.E.*

1911

4E–3 551.557:629.13

Rotch, A. L. and Palmer, A. H., **Charts of the atmosphere for aeronauts and aviators.** New York, John Wiley and Sons, **1911.** 98 p. 24 charts.—Majority of charts devoted to winds observed at Blue Hill. Maximum wind velocities at Blue Hill given for winter and summer to 30,000 ft and velocities at higher levels obtained from movement of clouds. Two charts devoted to frequency and velocity of winds in northeast trade region of Atlantic Ocean up to 30,000 ft. These two charts based on the four expeditions made by Teisserenc de Bort and Rotch on steam-yacht "Otaria." *Subject Headings:* **1. Upper air winds 2. Aeronautical meteorology 3. Blue Hill, Mass.**—*G.J.E.*

1912

4E–4 551.506.7(42)551.557(42

Cave, C. J. P., **The structure of the atmosphere in clear weather. A study of soundings with pilot balloons.** Cambridge, University Press, **1912.** 144 p. 47 figs. **GB-MO**—Discusses atmospheric structure shown by 200 pilot balloon ascents in southern England 1907–1908, 58 of which reached or exceeded 5 km. Different types of structure recognized in relation to surface and gradient winds, and to general distribution of pressure and temperature in the region. Five types described. Higher ascents show strongest winds often just below stratosphere. *Subject Headings:* **1. Pilot balloon observations 2. Atmospheric structure 3. Upper air winds.**—*G.J.E.*

4E–5 551.501.1:551.557

*Perlewitz, P., **Windbeobachtungen in den höheren Luftschichten des Atlantischen und südlichen Stillen Ozeans, nach Pilotballonaufstiege von Dr. Harry Meyer, 1909 bis 1911.** [Observations of wind in the upper air layers above the Atlantic and South Pacific Ocean, based on pilot balloon ascents conducted by Dr. Harry Meyer, 1909 to 1911.] *Annalen der Hydrographie und Maritimen Meteorologie*, 40(9):454–477, Sept. 1912. 6 tables, refs. **DWB**—Data and discussion of 57 pibal ascents (27 in North Atlantic, 12 in South Atlantic and 15 in eastern South Pacific), 1909–1911, from German training ships. Observations of wind variations with height up to 8.2 km in tropical Atlantic and Pacific found strikingly similar to upper wind data from Batavia (see 4E–11 below). *Subject Headings:* **1. Upper air wind data 2. Atlantic Ocean 3. Southeastern Pacific.**—*M.P.K.*

1915

4E–6 551.506.7(485)

*Funke, A., **Pilotballongobservationer i Abisko, 1913.** [Pilot balloon observations at Abisko, 1913.] *Svenska Vetenskaps-Akademien, Stockholm, Meteorologiska Iakttagelser i Sverige*, v. 57, 2A:1–14, 1915. In Swedish and French. **DLC**—Tables of 34 individual ascents made during the period August–October 1913, 18 exceeding 5 km and 4 exceeding 10 km. Abisko lies at 68°20′N., 18°49′E. *Subject Headings:* **1. Upper air wind data 2. Abisko, Sweden.**—*G.J.E.*

1916

4E–7 551.506.7(485)

Carlstedt, R., **Pilotballongobservationer i Abisko 1914 och 1915.** [Pilot balloon observations at Abisko 1914–1915.] *Svenska Vetenskaps-Akademien, Stockholm, Meteorologiska Iakttagelser i Sverige*, v. 57, 2B:15–59, 1916. [In Swedish and French.] **DLC**—Continuation of work commenced by Funke (*see item* 4E–6 above) in 1913. Results of 212 individual ascents made between February 1914 and October 1915 tabulated and over 90 ascents exceeded 5 km. Some reached 10–14 km. Results not summarized. *Subject Headings:* **1. Upper air wind data 2. Pilot balloon observations 3. Abisko, Sweden.**—*G.J.E.*

1919

4E–8 551.557(56)

Georgii, Walter, **Ergebnisse von Pilotsaufstiegen im Küstengebiet des südöstlichen Mittelländischen Meeres.** [Results of pilot balloon ascents along the coastal region of the southeastern Mediterranean Sea.] *Beiträge zur Physik der freien Atmosphäre*, 8:170–178, 1919. tables, refs. **DLC, NN**—Results of balloon ascents along the coast from Palestine to Egypt, April to Sept. 1916, tabulated and discussed. Wind direction, velocity, and gradients determined up to 10 km or less. (*Same item as* 2E–58, May 1951, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Palestine 3. Egypt.**

4E–9 551.557.36(485)

Lindholm, F., **Ergebnisse der Pilotvisierungen im nördlichsten Schweden.** [Results of pilot balloon observations in northern-most Sweden.] *Beiträge zur Physik der freien Atmosphäre*, 8:200–212, 1919. **DWB**—Observational data for Abisko (68°21′N, 18°49′E), 1913–15, analyzed. Summer, and winter mean speeds of NE, SE, SW and NW winds given for levels to 7 km, and change in speed indicated for adjacent layers. Wind directions at various levels and changes in direction between neighboring layers also given. Mean wind speeds and directions compared with values at other European stations. *Subject Headings:* **1. Upper air wind variations 2. Abisko, Sweden.**—*G.J.E.*

1920

4E–10 551.506.7:551.557(569.4)

Bamford, J. A., **Some observations of the upper air over Palestine.** *Royal Meteorological Society, Quarterly Journal*, 46:15–33, 1920. 7 figs., 8 tables, 2 refs. **MH-BH, NN**—Results summarized in tables and graphs of some upper air wind observations made over Palestine, 1917–1919. Air movements are analyzed with respect to monthly and seasonal variations in direction and velocity (horizontal and vertical). (*Same item as* 2E–62, May 1951, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Palestine.**

4E–11 551.506.7

*Indonesia. (K.) Magnetisch en Meteorologisch Observatorium te Batavia, **Results of registering balloon ascents at Batavia.** *Indonesia. (K.) Magnetisch en Meteorologisch Observatorium te Batavia, Verhandelingen*, No. 4, 1916. 109 p. numerous tables. Also: **Results of pilot balloon observations at and near Batavia in the years 1911–1918.** *Ibid.*, No. 6, 1920. 105 p. **DWB**—First

item, by W. VAN BEMMELEN, gives record of meteorograph ascents made between 1910–1915. Records of temperature and humidity analyzed and summarized. Wind data given for individual ascents. Second item gives results for each ½ km up to the limit of each ascent. Some 900 ascents included. *Subject Headings:* **1. Upper air winds 2. Upper air wind data 3. Batavia. I. van Bemmelen, W.**—*G.J.E.*

4E–12 551.524.7 551.557

*Hildebrandsson, H. H., **Étude préliminaire sur les vitesses du vent et les températures dans l'air libre à des hauteurs differentes.** [Preliminary study on wind speeds and temperatures in the free air at different heights.] *Geografiska Annaler*, Stockholm, 2(2):97–118, **1920.** 5 figs., 12 tables. **DWB**—Results of cloud and pilot balloon observations summarized. Table 1 gives height or horizontal mean speeds for cloud types observed at eleven stations over the world. Table V gives mean speeds to 16 km observed by pilot balloon ascents made in the Atlantic, Batavia, England and Germany. *Subject Headings:* **1. Upper air winds 2. Upper air temperatures.**—*G.J.E.*

1921

4E–13 551.557 551.582

Braak, Cornelius, **Het Klimaat van Nederlandsch-Indie. Deel 1. Algemeene Hovfdstakken.** [The climate of the Netherlands Indies. Pt. I—General Introduction.] *Indonesia.* (K.) *Magnetisch en Meteorologisch Observatorium te Batavia, Verhandelingen*, No. 8 [1921]. 528 p. **DWB**—Monthly resultant wind direction over Batavia from 1 to 7 kms. *Subject Headings:* **1. Climatology 2. Upper air winds 3. Netherlands Indies.**—*G.J.E.*

1922

4E–14 551.557(54)

*Field, J. H., **Mean monthly characters of upper winds deduced from the flights of pilot balloons at thirteen stations in India during the period 1910 to 1919.** *India. Meteorological Dept., Memoirs*, (3):41–136, **1922.** 13 tables. **NN**—Brief explanatory note followed by monthly tables for each station giving number of observations made at each level, mean wind speed, north and east components of resultant wind velocity, resultant wind velocity and resultant direction. In most months values are given for levels above 5 km. *Subject Headings:* **1. Upper air wind data 2. India.**—*G.J.E.*

1923

4E–15 551.506.7(261):551.557

Mey, A., **Pilotballonaufstiege auf einer Fahrt nach Mexiko September bis Dezember 1922.** [Pilot balloon ascents on a voyage to Mexico during Sept.–Dec. 1922.] *Aus dem Archiv der Deutschen Seewarte*, 51(4), **1923.** 33 p. 4 tables, 3 figs. **DWB**—Upper winds observed on the inward and outward journey from the English Channel to Mexico analyzed and tabulated. Vector and scalar means, and frequencies are given for the specified areas into which the routes were divided, and the wind changes with height discussed. *Subject Headings:* **1. Upper air wind data 2. Upper air wind frequencies 3. Atlantic Ocean.**—*G.J.E.*

4E–16 551.557.36(47)

Pick, W. H., **A note on the upper wind observations taken in North Russia in 1919.** *Great Britain. Meteorological Office, Professional Notes*, 3(32), **1923.** 4 tables. **DWB**—Pilot balloon ascents at 3 stations in NW Russia between Feb. and Sept. 1919 analyzed. Percentage frequencies and mean velocities given to 16,000 ft for Murmansk. Analyses for Archangel and Lumbusi given only to 10,000 ft. *Subject Headings:* **1. Upper air wind frequencies 2. Northwest U.S.S.R.**—*G.J.E.*

4E–17 551.557(47)

Pavlovsk, U.S.S.R. Aerologicheskaia Observatoriia, **Rezul'taty ezhednevnykh issledovanii svobodnoĭ atmosfery. Ianvar', 1923 . . .** –[**Dek. 1924.**] [Results of daily investigations of the free atmosphere. Jan. 1923 (monthly)–[Dec. 1924.] Pavlovsk 1923–[1925.] In Russian.—Details of daily pilot balloon ascents tabulated. Numerous ascents exceeded 5 km. Issued monthly or quarterly, series ran for two years. *Subject Headings:* **1. Upper air wind data 2. Pavlovsk, U.S.S.R.**—*G.J.E.*

4E–18 551.547:551.557(43)

Wagner, C. A., **Luftdruckgradient und Windstärke über Mitteleuropa bis 16 km. Höhe.** [Pressure gradient and wind force over Central Europe to a height of 16 kms.] *Meteorologische Zeitschrift*, 40:289–297; 329–340, **1923.** 10 tables, 20 refs. **DWB**—First part deals with pressure

gradient and second with wind force. Work of DIETZIUS in Vienna, PEPPLER and MAURAIN summarized and discussed. Annual mean wind speeds obtained by them at 0.5 km intervals to 16 km tabulated. Mean wind speeds compared with derived gradient winds. *Subject Headings:* **1. Upper air wind data 2. Upper air pressure 3. Central Europe.**—*G.J.E.*

1924

4E–19 551.582(94)

Kidson, Edward, **Observations from the Willis Island meteorological station.** *Australasian Association for the Advancement of Science, Sydney, Report*, 17:155–170, 1924. 4 figs., 2 tables. **NNA**—Notes and diagrams for the usual elements and pilot balloon data up to 6000 m for varying observational periods, 1922–1924, for this small island 250 miles east of Port Douglas in the Coral Sea are given. (*Same item as* 4D–35, April 1953, *MAB.*) *Subject Headings:* **1. Climatology 2. Upper air winds 3. Willis Island, Coral Sea.**—*H.P.K.*

1925

4E–20 551.557.2(261,263)

*Barlow, E. W., **The upper air circulation of the Atlantic Ocean.** *Great Britain. Meteorological Office, Professional Notes*, 3(39):200–217, 1925. 4 tables, 30 refs. **DWB**—Historical account of upper air observations made over Atlantic Ocean. Results summarized and general circulation discussed. Tabulated frequencies of wind directions and velocities in m/sec for layers up to 10 km appended. Results above this level combined into one group. Good bibliography given of early work. *Subject Headings:* **1. Upper air wind frequencies 2. Atlantic Ocean.**—*G.J.E.*

4E–21 551.582:629.13(611)

*Ginestous, G., **Étude climatologique du Golfe de Tunis en vue de l'aéronautique et de l'aviation.** . . . [Climatological study of the Gulf of Tunis for aeronautics and aviation . . . including climatic elements of Tunisia . . . a study of upper winds in Tunisian region (1920) . . . a study of the aerological soundings carried out at Karouba, 1920–1923.] Tunis, Service Météorologique, **1925.** 18 p. 69 figs., tables. **DWB**—An exhaustive climatological study of Gulf of Tunis region (northern Tunis) including a large section on upper air winds. Much data tabulated. Rainfall, temperature, etc. maps, diagrams and wind roses included. (*Same item as* 3A–82, Jan. 1952, *MAB.*) *Subject Headings:* **1. Climatology 2. Upper air winds 3. Aeronautical climatology 4. Gulf of Tunis 5. Tunisia.**

4E–22 551.557(62,624)

*Sutton, L. J., **The upper currents of the atmosphere in Egypt and the Sudan.** *Egypt. Physical Dept., Paper*, No. 17, **1925.** 136 p. 39 tables, 14 plates. **NNA**—Analysis of observations Helwan, Aswan, Wadi Halfa, Khartoum, Mongalla, Roseires and Lake Tana (Abyssinia). Helwan observations classified by weather types. Mean velocity and resultant direction of wind given at intervals of 500 m to heights varying between 8 km and 15 km. Percentage frequencies of wind speeds between specified values also given for each type. Sudan observations appear as means for each month observed. (*Same item as* 2J–110, Oct. 1951, *MAB.*) *Subject Headings:* **1. Upper air wind data 2. Egypt 3. Sudan.**—*G.J.E.*

4E–23 551.506.7 551.557.36(93)

*Thomson, Andrew, **Upper air observations 1923–1924.** Wellington, Apia Observatory, **1925.** 1 p. 4 figs., tables, 8 refs. **GB-MO**—Results of 141 pilot balloon ascents made between May 1923 and Dec. 1924. Frequency and velocity of winds and wind components at levels up to 15.5 km given for rainy season (Nov.–April) and dry season (May–Oct.). Details given of individual ascents. *Subject Headings:* **1. Upper air wind data 2. Upper air wind frequencies 3. Samoa. 4. Apia Observatory.**—*G.J.E.*

1926

4E–24 551.557.2(68)

Cox, G. W., **Some notes on the circulation of the atmosphere over South Africa.** *South African Journal of Science*, 23:103–167, Dec. **1926.** tables, fig. **GB-MO**—Survey of first pilot balloon ascents at East London, Port Elizabeth, Oudtshoorn, Durban, Pretoria and Capetown, April 1925–May 1926. Detailed analyses are given for the short period considered and include resultant winds and frequencies of specified wind directions. Results discussed in relation to South Africa's topographic features. *Subject Headings:* **1. Upper air winds 2. Topographic effects 3. South Africa.**—*G.J.E.*

4E–25 551.577.2(73/9) 551.557.36

*Gregg, Willis Ray, **An aerological survey of the United States. Part II. Results of observations by means of pilot balloons.** *Monthly Weather Review, Supplement* 26, **1926.** 60 p. 14 figs., 18 tables. **DWB**—Country divided into 9 areas for more reliable study of the nearly 5,000 observations available at 5 km. Insufficient data available for study of area west of the Great Plains States. Results set out in manner best calculated to meet the needs of aviation, with data to 6 km generally. Seasonal average resultant winds given to 10 km for each group. *Subject Headings:* **1. Upper air wind frequencies 2. Aerological studies 3. United States.**—*G.J.E.*

4E–26 551.557(471.1)

*†Kallio, N., **Über die Windverhältnisse der oberen Luftschichten am Aerologischen Observatorium Ilmala nebst Übersichten für andere Gegenden.** [On the wind conditions of the upper air layers at the Aerological Observatory of Ilmala, including surveys for other regions.] *Finska Vetenskaps-Societeten, Helsinki, Commentationes Physico-Mathematicae,* 3(3), **1926.** 149 p. 75+53 tables, 8 figs., bibliog. p. 131–149. **DLC**—Excellent analysis in the main confined to heights up to 3 km or 4 km. Results compared with values for stations in Europe and U. S. Comprehensive bibliography of upper wind observations and related literature on a world basis includes more than 500 items. *Subject Headings:* **1. Upper air wind analysis 2. Ilmala, Finland.**—*G.J.E.*

1927

4E–27 551.557.36(96)

Beals, E. A., **Free-air winds over Honolulu and Guam.** *Monthly Weather Review,* 55:222–226, **1927.** 6 tables. **DWB**—Results of ascents made at Pearl Harbor, 1922–1924 inclusive, analyzed. Seasonal and annual percentage frequencies of wind direction given up to 10 km. Observations at Guam not so complete. Mean monthly resultant wind directions given. Average seasonal and annual wind speeds at both stations compared for levels up to 4 km. *Subject Headings:* **1. Upper air wind frequencies 2. Honolulu, Hawaiian Islands 3. Guam.**—*G.J.E.*

4E–28 551.557.2(267) 551.557.36

Walter, A., **Results of observations on the direction and velocity of the upper air current over the South Indian Ocean.** *Great Britain. Meteorological Office, Geophysical Memoir,* 4(39), **1927.** 32 p. 5 figs., 6 tables, append. **DWB**—Results of investigation into upper air currents carried out in Mauritius between July 1925 and April 1926 analyzed. North and east components given for individual ascents up to 5 to 8 km. Other tables give mean components for each month and frequencies and percentage frequencies of wind directions and wind speeds at various heights to 8 km. *Subject Headings:* **1. Upper air wind frequencies 2. South Indian Ocean.**—*G.J.E.*

1928

4E–29 551.557.2(54)

*Harwood, W. A., **The free atmosphere in India. (7) Heights of clouds, and directions of free air movement. (8) Upper air movement in the Indian monsoons and its relation to the general circulation of the atmosphere.** *India. Meteorological Dept., Memoirs,* 24(7):217–248, 249–273, **1928.** 26 tables. 9 plates. **DWB**—Mean levels of low, middle and high clouds taken as 2 km, 5 km, and 9 km. Percentage frequencies of wind direction at each level given in Part 7 for hot and cool seasons at 16 stations. Monthly percentage frequencies given for both medium and high cloud movements, and for wind directions obtained from pilot balloon observations at 5 km and 9 km. In Pt. 8, these general movements are discussed with reference to NE and SW monsoons. Plates show wind distribution at surface, 2 km, 5 km, and 9 km levels for the cool and hot seasons and for the SW monsoon period. *Subject Headings:* **1. Upper air wind frequencies 2. Monsoons 3. Atmospheric circulation 4. India.**—*G.J.E.*

4E–30 551.557.36(47)

Ivitskiĭ, S. K., **Raspredelenie vetra s vysotoiu nad Leningradom po pilotnym nabliudeniiam za gody 1921–25.** [Distribution of wind with height over Leningrad according to pilot-observations within the period 1921–1925.] *Zhurnal Geofiziki i Meteorologii,* Leningrad, 5(1):75–86, **1928.** 9 tables, 7 figs. English summary p. 87. **DLC**—Observations from 502 ascents grouped into warm period (April–Oct.) and cold (Oct.–April). Tables of frequencies given to 3 km and of mean velocities given for both periods, up to 6 km. Upper winds pre-eminently westerly in both seasons. *Subject Headings:* **1. Upper air wind frequencies 2. Leningrad, U.S.S.R.**—*G.J.E.*

4E–31 551.557.36(47)

*Klado, T., **Windgeschwindigkeit und Windrichtung über Pavlovsk, 1920–1924.** [Wind speed and direction above Pavlovsk, 1920–1924.] *Beiträge zur Physik der freien Atmosphäre,* Leipzig,

14:127–130, **1928.** 7 tables. **DLC**—Results of pilot balloon observations analyzed. Mean winds given for various levels up to 4 km, and frequencies of various wind speeds and wind directions given for both the winter and summer half-years. *Subject Headings:* **1. Upper air wind observations 2. Upper air wind frequencies 3. Pavlovsk, U.S.S.R.**—*G.J.E.*

4E–32 551.5(02) 551.513

Shaw, Sir Napier and Austin, E., **Manual of Meteorology, Vol. II. Comparative meteorology.** Cambridge, **1928.** 445 p., 225 figs. **DLC**—This second volume of SHAW's "Manual" had as its principal aim a satisfactory representation of the general circulation and its changes. Chapt. VI, dealing with pressure and wind gives upper level pressure patterns and discusses winds in the upper air. Directions of motion of upper clouds are presented for various latitudes. Diagrams are given to show variation of wind velocity with height at Lindenberg, Batavia, Samoa and India. *Subject Headings:* **1. Meteorology 2. Atmospheric circulation 3. Upper air winds.**—*G.J.E.*

4E–33 551.506.7(57)

*Trutneva, V. V. and Karamyshev, E. D., **Rezul'taty aerologischeskikh nabliudeniĭ v Mongolii.** [Results of aerological observations in Mongolia.] *Irkutsk. Irkutskaia Geomagnitnaia i Geofizicheskaia Observatoriia, Trudy,* 2/3:153–174, **1928.** German summary p. 173–174. 5 tables.—Results of pilot balloon observations made at aerological station in Urga (Ulan-Bator-Choto), 1925–1927. Mean component winds, resultant winds, scalar speeds and maximum wind speeds given for levels up to 8 km for cold and warm periods, for total period, and for each month. Individual results are given up to 15 km. *Subject Headings:* **1. Upper air wind data 2. Mongolia.**—*G.J.E.*

1929

4E–34 551.557(584)

Bizov, N. P., **Nekotorye osobennosti v raspredelenii vetrov nad Ashkhabadom po dannym sharo-pilotnykh nabliudeniĭ za 1928 g.** [Some characteristics of the distribution of the wind over Ashkabad from data obtained from pilot balloon observations 1928.] Ashkhabad, Turkmen Meteorological Bureau, **1929.** 20 p. 8 tables, 5 figs. In Russian.—Work constitutes a first attempt to discuss some of the characteristics of airflow above SW regions of central Asia. Only ascents made at 0800 hrs in average sunny weather considered, total of 173. Mean wind speeds are given for year and for summer and winter half-year periods, and annual mean speeds given for winds in the four quadrants. West and NW winds represent 50% of the winds at 3 km, 70% at 6 km, and 86% at 10 km. *Subject Headings:* **1. Upper air winds 2. Ashkhabad, Turkmen S.S.R.**—*G.J.E.*

4E–35 551.577.36(68)

*South Africa. Meteorological Office, **Upper winds of South Africa.** [Monthly frequency tables, various levels up to 20 km.] *South Africa. Meteorological Office, Annual Report,* **1929.** Append. p. 227–672. 2 plates, tables. **GB-MO**—Tables for thirteen stations show monthly frequency per thousand of winds from different directions within certain speed limits, for each level and at each station. Mean speed given for each direction. *Subject Headings:* **1. Upper air wind frequencies 2. South Africa.**—*G.J.E.*

4E–36 551.557(54)

Sur, N. K., **Winds in higher levels over Agra.** *India. Meteorological Dept., Scientific Notes,* 2(15), **1929.** 38 p. 14 figs. **DWB**—Composite diagrams drawn showing speed, direction and NE components of these velocities for 60 pilot balloon ascents that attained heights above 14 km. *Subject Headings:* **1. Upper air winds 2. Agra, India.**—*G.J.E.*

4E–37 551.506.7 551.557.36(93)

*Thomson, A., **Observations of upper air-currents at Apia, Western Samoa. (Second series.)** Wellington, Dept. of Scientific and Industrial Research, **1929.** 79 p. 12 figs., 6 tables.—Data presented for 380 pilot balloon ascents made between May 1923 and April 1928. Summaries and diagrams include earlier data. Percentage frequencies of wind speeds and directions at various levels, resultant and component winds and individual observations are tabulated. *Subject Headings:* **1. Upper air wind data 2. Upper air wind frequencies 3. Apia, Samoa.**—*G.J.E.*

1930

4E–38 551.506.7(57)

Akademiia Nauk SSSR, Komissiia po Izucheniiu Iakutskoĭ Avtonomnoĭ Sovetskoĭ Sotsialisticheskoĭ Respubliki, **Trudy. Tom VIII. Meteorologicheskie i aerologicheskie nabliudeniia v Iakutii v 1925 g. Chast' II, Nabliudeniia aerologicheskikh stanstiĭ: Iakutsk i Petropavlovskoe.**

Tom XVI. Chast' II, Nabliudeniia aerologicheskikh stanstii: Iakutsk, Petropavlovskoe i Verkhoiansk v 1926 g. [Works of the Commission for the Study of the Autonomous Soviet Socialistic Republic of Yakutsk. Vol. VIII. Meteorological and aerological observations in Yakutsk in 1925. Pt. II, Aerological observations at the stations Yakutsk and Petropavlovskoe. Vol. XVI. Pt. II, Aerological observations at the stations Yakutsk, Petropavlovskoe and Verkhoiansk in 1926.] Leningrad, **1928; 1930.** 57+p.; 163+p. **GB-MO**—Results of individual pilot balloon ascents tabulated. Wind speed and directions given for each level. Upper levels vary with each ascent. *Subject Headings:* **1. Upper air wind data 2. Yakutia, U.S.S.R.**—*G.J.E.*

4E–39 551.5(058)(689.1)

Southern Rhodesia. Meteorological Dept., **Meteorological report for the year ended 30 June 1929–.** Salisbury **1930–. GB-MO**—Details of meteorological observations made during year. Upper wind data not contained in every report, but included in reports for 1929, 1930, 1933 and 1934. The 1936 report gives monthly wind frequencies for levels up to 5 km for Bulawayo and Salisbury, and mean monthly upper wind speeds and directions. Values for Salisbury cover period 1928–1935 and extend to 10 km. Bulgawayo data cover period 1931–1935 and extend to 8 km. *Subject Headings:* **1. Annual meteorological reports 2. Upper air wind data 3. Southern Rhodesia.**—*G.J.E.*

4E–40 551.557

*Sutton, L. J., **Upper winds at Cairo and Khartoum.** *Egypt. Physical Dept., Paper*, No. 27, **1930.** 52 p. 4 plates, numerous tables, refs. **NNA**—Results of 2600 pilot balloon observations 1920–1928, presented as monthly frequency tables of direction and speed, for altitude intervals of 500 meters; observations included for 5000 and 10,000 meters. Directions of resultant winds at each altitude, as obtained from the total direction frequencies, without respect of velocity, tabulated. Lists of Physical Dept. publications included. (*Same item as* 2J–128, Oct. 1951, *MAB.*) *Subject Headings:* **1. Upper air wind frequencies 2. Cairo, Egypt 3. Khartoum, Sudan.**—*M.P.K.*

4E–41 551.506.5(268)

*Sverdrup, Harald Ulrik, **Norwegian North Polar Expedition with the "Maud" 1918–1925. Scientific results. Vol. III, Meteorology, Part II, Tables.** Bergen, Geofysisk Institutt, **1930.** 527 p. **DWB**—Pilot balloon observations and details of individual ascents, many of which exceeded 5 km. Location of each ascent given in tables—(approximately 65–70°N, 150–170°E). *Subject Headings:* **1. "Maud" Expedition, 1918–1925 2. Upper air data 3. Arctic.**—*G.J.E.*

4E–42 551.552(51) 551.576.5 551.557(51)

Gherzi, E., **The winds and the upper air current along the China Coast and in the Yangtse valley.** Zi-ka-wei, China, Observatoire, **1931.** 240+p. 2 appends. **GB-MO**—Publication divided into four parts, Pt. I containing a discussion on monsoon winds and including pilot balloon soundings made at Chefoo between May 1928 and Sept. 1928, and at Shanghai, Sept.–Dec. 1929. Pt. IV gives statistical data of the mean direction of high, medium and low clouds. *Subject Headings:* **1. Cloud movement 2. Upper air wind observations 3. China. I. Zi-ka-wei, China. Observatoire.**—*G.J.E.*

4E–43 551.510.5

Gregg, Willis Ray; Samuels, L. T. and Stevens, W. R., **The meteorology of the free atmosphere.** *National Research Council, Wash., D. C., Bulletin*, No. 79:67–133, **1931.** figs., 33 refs. **DLC**—Sounding methods described and atmospheric structure discussed. Figures given of wind directions and velocities for America, and of anticyclonic and cyclonic wind velocities over Northern and Southern United States, up to 8 km. *Subject Headings:* **1. Atmospheric structure 2. Upper air soundings 3. United States.**—*G.J.E.*

4E–44 551.506.7 551.557

Hamburg. Deutsche Seewarte, **Die Hamburger Registrierballonfahrten von 1926 bis 1930.** [Ascents of registering balloons in Hamburg from 1926 to 1930.] *Aus dem Archiv der Deutschen Seewarte*, Hamburg, 50(5), **1931.** 60 p. **DLC**—Details of 19 ascents above 5 km giving temperature, and relative humidity for various pressure levels, and wind direction and speed for various heights. Heights of isobaric surfaces calculated up to 100 mb. *Subject Headings:* **1. Upper air observations 2. Upper air winds 3. Isobaric surfaces 4. Hamburg, Germany.**—*G.J.E.*

4E–45 551.506.7:551.557.2(47,57)

*U.S.S.R. Gidrograficheskoe Upravlenie. Gidrometeorologicheskiĭ Otdel, **Résultats des observations effectuées au moyen des ballons pilotes en 1926 aux stations aérologiques de l'Administration de l'Hydrographie.** [Results of pilot balloon observations made at stations of the Administration of Hydrography during 1926.] Leningrad, **1930.** 16 p. of tables. **GB-MO**—Results of

ascents at Aleksandrovsk (69°12′N, 33°28′E); Matochkin Shar (73°16′N, 56°24′E); Archangel; Astrakhan; Baku and Sevastopol and given for levels up to 10 km. *Subject Headings:* **1. Upper air wind data 2. U.S.S.R.**—*G.J.E.*

1931

4E–46 551.557.3

Dominik, M. H., **Höhenwindmessungen auf dem Ozean.** [Upper wind measurements over the ocean.] *International Commission for the Exploration of the Upper Air, Madrid, 1931, Procès-Verbaux des Séances.* Published as: *International Meteorological Organization, Publication,* No. 8, Append. 16:73–76, **1931.** 7 figs. **GB-MO**—Shows percentage frequencies of wind directions at 6000–7000 m over the N. and S. Atlantic, for spring and summer, and for autumn and winter. *Subject Headings:* **1. Upper air wind frequencies 2. Atlantic Ocean.**—*G.J.E.*

4E–47 551.557(57)

Isherskaia, E. V., **Iz rezul'tatov pilotnykh nabliudenii vo Vladivostoke zimoiu 1929–30 goda.** [On the results of pilot balloon ascents at Vladivostok in the period 1929–30.] *Vladivostok. Dal'nevostochnyĭ Geofizicheskiĭ Institut, Izvestiia,* 1:239–247, **1931.** 6 tables, 3 refs. English abstract p. 247.—Data obtained from 25 ascents during winter 1929–30 presented and discussed. Pressure was high over East Asia and low over the sea. Ten ascents exceeded 5 km. Winds tended to back with height, being mainly WSW to WNW above 5 km. *Subject Headings:* **1. Upper air wind data 2. Vladivostok, U.S.S.R.**—*G.J.E.*

4E–48 551.587

*Köppen, Wladimir and Geiger, Rudolf, **Handbuch der Klimatologie. Band I, Teil F.: Klimatologie der freien Atmosphäre.** [Handbook of Climatology. v. I, Pt. F: Climatology of the free air.] Berlin, A. Wagner, **1931.** 70 p. numerous tables, 8 figs. **DWB, DLC**—Upper air data for North America, Europe, Mediterranean, Tropics, Atlantic, India, Arctic, Antarctic and other areas. Mean air transfer calculated for each month up to heights well in excess of 5 km for many areas. *Subject Heading:* **1. Upper air climatology.**—*G.J.E.*

4E–49 551.506.5 551.506.7

Michigan. University, **Reports of the Greenland expeditions of the University of Michigan (1926–1931). Pt. I. Aerology, Expeditions of 1926 and 1927–29.** Ann Arbor, **1931.** 259 p. 23 plates, 30 figs.—Results given of pilot balloon observations at Maligiakfjord, Mount Evans and near the margin of the Otto Nordenskjold Glacier. Introduction includes figures showing average upper air currents. *Subject Headings:* **1. Upper air wind observations 2. Expeditions 3. Greenland.**—*G.J.E.*

4E–50 551.557(729)

*Ray, C. L., **Free air winds at San Juan, P. R.** *Monthly Weather Review,* 59:414–416, **1931.** 6 tables, 3 figs. **DWB**—Results obtained from more than 500 pilot balloon ascents that reached 10 km analyzed. Percentage frequencies given of seasonal wind directions and of wind components at and above 10 kms. Seasonal mean free air winds and seasonal free-air resultant winds given up to 15 km. *Subject Headings:* **1. Upper air wind frequencies 2. San Juan, Puerto Rico.**—*G.J.E.*

1932

4E–51 551.506.7(65)

Algiers. Université. Institut de Météorologie et de Physique du Globe, **Observations d'Alger Université. Jan. 1921–Dec. 1931.** [Observations at Algiers University.] Algiers [1921–1932]. **GB-MO**—Number of observations of upper wind from 16 compass points given for ascents at Algiers. Levels generally exceeded 5 km. Mean speed (scalar) and maximum observed speed given for each level. After Jan. 1932 title became "Université d'Alger—Bulletin Mensuel de l'Institut de Météorologie et de Physique du Globe de l'Algérie," and continued in this form until December 1937. *Subject Headings:* **1. Upper air winds 2. Algiers. I. Algeria. Service Météorologique.**—*G.J.E.*

4E–52 551.506.7(261):551.557

Eckardt, B. and Lühe, P., **Ergebnisse von Höhenwindmessungen auf dem Ostatlantischen Ozean längs der westfrikanischen Küste im Januar und Februar 1929. X. Forschungsfahrt der Deutschen Seewarte.** [Results of upper wind measurements in the east Atlantic Ocean along the west African coast in January and February 1929. X. Scientific expedition of the Deutsche Seewarte.] *Aus dem Archiv der Deutschen Seewarte,* Hamburg, 51(1), **1932.** 39 p., 7 charts, 8 tables. **DLC**—Complete analysis of wind directions and speeds observed in various latitudes during voyage

which extended as far south as Freetown. Analysis extended to height of 9–10 km. Individual ascents are also given. *Subject Headings:* **1. Upper air wind data 2. Upper air wind frequencies 3. Atlantic Ocean.**—*G.J.E.*

4E–53 551.506.7(491):551.557

Georgi, Johannes and Kuhlbrodt-Raemder, L., **Höhenwindmessungen auf Island 1909–1928. Zusammenstellung und statistische Bearbeitung von 574 Pilotwindmessungen aus Island und den Küstengewässern.** [Upper wind measurements in Iceland 1909–1928. A collection, and statistical investigation, of 574 pilot balloon measurements made in Iceland and the coastal waters.] *Aus dem Archiv der Deutschen Seewarte*, Hamburg, 51(5), **1932.** 84 p. 2 figs. **DWB**—Observational data given for Akureyri, Reykjavik, Adalvik and the "Meteor." Results analyzed and mean annual and seasonal component and resultant wind speeds given up to 15 km. Scalar mean wind speeds, maximum speeds, and frequency of wind directions also given. *Subject Headings:* **1. Upper air wind data 2. Upper air wind frequencies 3. Iceland.**—*G.J.E.*

4E–54 551.557(99)

Haines, W. C., **Winds of the Antarctic.** *American Geophysical Union, Transactions*, 13:124–128, **1932.** 6 figs. **DWB**—Upper winds observed at Little America Jan. 1929–Feb. 1930 discussed. Most striking feature at 5 km is predominance of WSW winds. Resultant direction at this level is N 78°W and resultant speed is 2.9 m/s. *Subject Headings:* **1. Upper air winds 2. Antarctica.**—*G.J.E.*

4E–55 551.506.7:551.557

Hamburg. Deutsche Seewarte, **Höhenwindmessungen durchgeführt von Schiffsoffizieren der deutschen Handelsflotte. 1. Folge, September 1928 bis März 1929.** [Upper wind measurements carried out by ships officers of the German Merchant Navy. Pt. 1, Sept. 1928–March 1929.] *Aus dem Archiv der Deutschen Seewarte*, Hamburg, 48(3), **1929.** 31 p. tables. **2. Folge, März 1929 bis April 1930.** *Ibid.*, 50(1), **1931.** 68 p. tables. **3. Folge, April 1930 bis September 1931.** *Ibid.*, 51(3), **1932.** 121 p. **DLC**—Results given in table for each ascent made from the various ships. *Subject Heading:* **1. Upper air wind data.**—*G.J.E.*

4E–56 551.558.21

*Kawano, M. and Kitazawa, S., **Comparison between the distribution of wind directions over the Hakone-range and that in the free atmosphere over Misima.** *Geophysical Magazine*, Tokyo, 6:69–78, **1932.** 3 figs., 3 tables. **DWB**—Wind data are for Hakoneyama, height about 1000 m and pilot balloons at Misima 12 km to SW. Mountain winds show maxima from NE–ENE and SW–WSW, nearly perpendicular to general trend of the range, but free air above 1000 m shows only one maximum, from WSW. Data set out in detailed tables. (*Same item as* 2K–125, Nov. 1951, *MAB.*) *Subject Headings:* **1. Mountain meteorology 2. Upper air winds 3. Japan.**—*C.E.P.B.*

1933

4E–57 551.506.7(497.2)

Bulgaria. Service Météorologique de l'Aviation Bulgare, **Résultats des observations avec ballon-pilotes en Bulgarie. Années 1925–1931.** [Results of pilot-balloon observations in Bulgaria. Years 1925–1931.] Sofia, **1933.** 131 p. tables. In Bulgarian, French translation of headings. **GB-MO**—Results given of individual ascents each month at Bojourichte (near Sofia) and Kazanlik (42°37′N, 25°24′E). Third part analyses winds up to 3 km above the plain of Sofia. *Subject Heading:* **1. Upper air wind data 2. Bulgaria.**—*G.J.E.*

4E–58 551.557.2(991)

Camm, H. E. and Banfield, H. E., **The frequency and velocity of the wind above Sydney . . . from pilot balloon observations at Sydney Weather Bureau during period 1926–1932.** [Sydney, 1933?] 4 p. figs. Mimeographed. **DWB**—Wind roses summarize results of 3231 ascents over Sydney 1926–1932, accompanied by explanatory comments. (*Same item as* 4D–64, April 1953, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Sydney, Australia.**—*H.P.K.*

4E–59 551.557.36(46)

Campo, G., **Resum de 17 anys de sondatges a Barcelona amb globus pilots (1914 a 1930).** [Summary of 17 years pilot balloon soundings at Barcelona.] *Catalonia. Servei Meteorològic, Notes d'Estudi*, 54, **1933.** 75 p. 4 tables, 16 figs. French summary p. 73–74. **GB-MO**—Results of 17 years observations summarized for each season and for levels up to 6 km. Percentage frequencies of speeds between certain limits and of wind directions given for each level and season. *Subject Headings:* **1. Upper air wind frequencies 2. Barcelona, Spain.**—*G.J.E.*

4E–60 551.555.1:551.557

Fassig, Oliver L., **The trade winds of the eastern Caribbean.** *American Geophysical Union, Transactions*, 14:69–78, **1933.** 10 figs. **DWB**—Using upper wind data for Puerto Rico, author nvestigated vertical extent of the trade wind and found it to vary from less than 4 km in spring o 8 km in Aug. Diagrams show average conditions and reveal rapid day to day changes that may occur and that are suggestive of forces which may explain tropical hurricanes. *Subject Headings:* **1. Trade winds 2. Upper air winds 3. Caribbean Sea.**—*G.J.E.*

4E–61 551.557(597)

Hubert, H., **Les courants aériens en Cochinchine.** [Upper winds in Cochin China.] *Académie des Sciences, Paris, Comptes Rendus*, 197:1677–1678, Dec. 18, **1933. DLC**—Observations made rom 1931 analyzed and seasonal distribution of wind between surface and 10 km shown. *Subject Headings:* **1. Upper air winds 2. Cochin China.**—*G.J.E.*

4E–62 551.557.36(43)

Keil, Karl, **Über die Häufigkeit verschiedener Windrichtungen und Windgeschwindigkeiten in verschiedenen Höhenschichten über Berlin.** [On the frequency of different wind directions and vind speeds at different height levels above Berlin.] *Zeitschrift für angewandte Meteorologie*, 50:212–216, **1933. DLC**—Seasonal and annual percentage frequencies tabulated for winds between fixed imits at levels up to 8 km (6 km in winter). Tables give percentage frequencies of calms, and of vinds from N, S, E, and W for the same periods. *Subject Headings:* **1. Upper air wind frequencies 2. Berlin, Germany.**—*G.J.E.*

4E–63 551.557.36

Keil, Karl, **Der Wind in verschiedenen Höhen über Berlin.** [Wind at different heights above Berlin.] *Beiträge zur Physik der freien Atmosphäre*, Leipzig, 20:291–298, **1933.** 6 figs., 8 tables, 2 refs. **DLC**—Upper wind observations over Berlin, 1926–1932, analyzed. Frequencies of wind speeds and direction, and of mean wind given up to 6 km. *Subject Heading:* **1. Upper air wind requencies 2. Berlin, Germany.**—*G.J.E.*

4E–64 551.557(485)

Östman, C. H., **Vinden i Sveriges högre luftlager: resultat av pilotballongobservationer ulförda under årea 1919–1929.** [Wind in the upper air over Sweden: results of pilot-balloon observations nade in the period 1919–1929.] *Sweden. Meteorologisk-Hygrografiska Anstalt, Meddelanden*, 5(3), **1933.** 38 p. 15 figs., 16 tables, 20 refs. In Swedish, French summary p. 38. **DWB**—Upper vind observations for six stations analyzed. Winds observed at 7 km or higher dealt with in less letail than for lower levels. Means of such winds given for summer and for year for each station t levels between 7 km and 10 km. Seasonal and annual frequencies given of wind directions with speeds between specified values for 7, 10 and 11 km levels at all six stations combined. *Subject Headings:* **1. Upper air wind observations 2. Sweden.**—*G.J.E.*

1934

4E–65 551.506.7 551.557(635)

Bossolasco, Mario, **Das Strömungs-system der Luft über Mogadischu.** [The system of air currents above Mogadiscio.] *Zeitschrift für Geophysik*, 10:360–368, **1934. DLC**—A short report of upper wind observations made at Mogadiscio during the polar year 1932–33. *Subject Headings:* **1. Upper air wind observations 2. Mogadiscio, Italian Somaliland.**

4E–66 551.552 551.557.36(677.2)

Brooks, C. E. P. and Durst, Charles S., **The winds of Berbera. Discussion of observations made under the supervision of R. S. Taylor, M.B., Ch.B., Principal Medical Officer.** *Great Britain. Meteorological Office, Professional Notes*, No. 65, **1934.** 13 p. 5 tables, 8 figs., 3 refs. M.O. 336e. **DLC**—Upper wind observations made between April 1931 and July 1932 summarized. Monthly vind roses included for levels up to 10,000 ft, and seasonal roses for levels between 10,000 and 20,000 t. NE wind very constant at upper levels during SW monsoon (June–September), and becomes nore easterly during Oct.–Dec. *Subject Headings:* **1. Upper air wind roses 2. Upper air wind requencies 3. Berbera, British Somaliland.**—*G.J.E.*

4E–67 551.513 551.557.2(5)

Chu, Coching, **Circulation of the atmosphere over China.** *Academia Sinica. Institute of Meteorology. Memoir*, No. 4, **1934.** 20 p. 4 figs., 28 refs.—Surface and upper air circulation dis-ussed, the latter on basis of cloud observations and pilot balloon ascents. Tables give wind direction o 6 km over Nanking for winter and summer, and wind speeds to 8 km for Jan. and 9 km for July. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds.**—*G.J.E.*

4E–68 551.506.2:551.557(639.1)

Debrecen, Hungary. Tudományegyetem. Földrajzi Intézet, **A Debreceni egyetem földrajzi intézetének az 1932/33—iki polaris ev alkalmával végzett szélmérései.** [Upper wind measurements taken by the Geographical Institute at the University in Debrecen in the Polar Year 1932–33.] Debrecen, **1934.** 23+11 p. tables. In Hungarian, German translations of headings. German summary p. 11.—Observations of wind speed and direction for fixed levels up to 3 km. A separate section gives winds above 3 km at 0.5 km intervals to 7 km. *Subject Headings:* **1. International Polar Year, 1932–1933 2. Upper air wind data 3. Debrecen, Hungary.**—*G.J.E.*

4E–69 551.506.1(51)(058) 551.506.7(51)

Hong Kong. Royal Observatory, **Meteorological results, 1933–1939** [and] . . . **Part II, Upper air observations, 1947–.** Hong Kong, **1934–. DLC**—Details of individual pilot balloon ascents made throughout each year. Publication ceased in 1939 and was resumed in 1947 when quantity of observational material made it desirable for upper air data to be published separately. Wind observations given up to 18,000 ft. Radar wind observations included in 1949. *Subject Headings:* **1. Yearbooks 2. Upper air wind observations 3. Hong Kong.**—*G.J.E.*

4E–70 551.513:551.557(691)

Huber, H., **La circulation de l'air atmosphérique en altitude au-dessus de Madagascar.** [Upper air circulation over Madagascar.] *Académie des Sciences, Paris, Comptes Rendus,* 198:1250–1252, **1934. DWB**—From observations at Tananarive, Majunga, Diego-Suarez, Tamative and Fort-Dauphin, author discusses main air currents and their seasonal variation. During period of the trades, an upper wind from NW–W is observed as a permanent feature extending up to at least 10 km. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds 3. Madagascar.**—*G.J.E.*

4E–71 551.506.7

International Commission for the Exploration of the Upper Air, **Ergebnisse der aerologischen Messungen, 1925–1928. Resultats des ascensions aérologiques. Results of aerological ascents.** Berlin, **1929-1934.** 6 v. **DLC**—Supersedes the Commission's "Comptes rendus des jours internationaux, 1923–24." Upper air observations include upper winds made at numerous stations to varying heights often exceeding 5 km. *Subject Headings:* **1. Upper air wind data. I. Shaw, Sir William Napier** *(ed.).*—*G.J.E.*

4E–72 551.557.36(43)

Keil, Karl, **Die prozentische Verteilung von Windrichtung und Windgeschwindigkeit in verschiedenen Höhen Berlin's in den einzelnen Jahreszeiten.** [The percentage distribution of wind direction and speed at various heights above Berlin in each season.] *Zeitschrift für angewandte Meteorologie,* 51(7):215 220, July **1934.** 4 tables. **DWB**—From ascents made between 1926 and 1932 percentage frequencies are tabulated at 500 m intervals to 3 km, and then at 4 km and 5 km for winds from N, S, E and W of speeds between specified limits. Tables are given for each season and the results briefly discussed. *Subject Headings:* **1. Upper air wind frequencies 2. Berlin, Germany.**—*G.J.E.*

4E–73 551.557

*Kidson, Edward, **Winds in the upper air at Wellington.** *New Zealand. Meteorological Office, Meteorological Office Note,* No. 15, **1934.** 8 p. 3 figs., 2 tables, refs. **DWB**—Three years (1929–1931) of observation of upper air by pilot balloons are summarized, including brief tables of seasonal percentage frequencies of visibility and height of low cloud, and seasonal upper air wind roses for different heights. (*Same item as* 4D–73, April 1953, *MAB.*) *Subject Headings:* **1. Upper air data 2. Wellington, New Zealand.**—*H.P.K.*

4E–74 551.506.7 551.557.36

South Africa. Meteorological Office, **Upper winds of South Africa. Detailed results of pilot balloon observations. Appendix to report for the year 1929.** Pretoria, **1934. GB-MO**—Monthly frequency per 1000 given for winds from different directions for specified speed limits at various levels up to 20 km. Mean speeds also given. Data included for thirteen stations, but periods in most cases limited to one year of observation. *Subject Headings:* **1. Upper air wind frequencies 2. South Africa.**

1935

4E–75 551.557.2(68)

Cox, G. W., **The circulation of the atmosphere over South Africa.** *South Africa. Meteorological Office, Meteorological Memoir,* No. 1, **1935.** 74 p. 40 plates. **GB-MO**—Analysis of pilot balloon observations made at 13 stations in the Union. Resultant winds shown for summer, winter

and year at 1 km intervals up to 6 km (7 km for the year). Tables give monthly wind velocities and frequencies. *Subject Headings:* **1. Upper air winds 2. South Africa.**—*G.J.E.*

4E–76 551.513 551.557

Hubert, H., **Les mouvements généraux de l'air atmosphérique au-dessus des colonies françaises.** [The general air movement above the French colonies.] *Annales de Physique du Globe de la France d'Outre-mer*, 2:1–27, 73–82, **1935.** 31 figs. **DWB**—Circulation over Africa first considered, and limits of the various upper currents discussed in light of data for Dakar, Saint-Louis, Niamey, Gao, Bangui, Yaounde, Abidjan, French Somaliland. Results given in diagrammatic form for heights up to 10 km. Attention then turned to Indo-China, based on observations at Saigon, Phu-Lien, Tourane, Battambang, Hanoi, Vinh and Vientiane. Observations from Martinique, French Guiana, Saint-Pierre and Miquelon briefly discussed. In second part author deals in a similar way with Madagascar, Reunion and French Oceania, and discusses general circulation in intertropical areas. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds 3. French Somaliland 4. Indo-China 5. French Oceania.**—*G.J.E.*

4E–77 551.557(54)

*India. Meteorological Dept., **Normal monthly percentage frequencies of upper winds at 4, 6, 8 and 10 km. above sea level, obtained from pilot balloon ascents.** *India. Meteorological Dept., Scientific Notes*, 6(66), **1935.** 121 p. **DWB**—Data for 34 stations. Eight wind directions considered. *Subject Headings:* **1. Upper air wind data 2. India.**—*G.J.E.*

1936

4E–78 551.557

*Bleeker, Wouter, **De gemiddelde Hoogtewind boven De Bilt volgens Loodsballon-waarnemingen (1922–1931).** [The mean upper wind above De Bilt from pilot balloon observations 1922–1931.] Zutphen [**1936**]. 109 p. 50 tables.—Complete analysis of the observations. Tables include monthly averages of wind at the various levels for morning and noon, and component wind speeds. Comparatively few ascents exceeded 8 km. *Subject Headings:* **1. Upper air wind data 2. Netherlands.**—*G.J.E.*

4E–79 551.557.2(988,491)

Bleeker, Wouter, **Die mittlere Windgeschwindigkeit und Luftversetzung in Angmagssalik und Reykjavik während des zweiten internationalen Polarjahres.** [Mean wind speed and air movement at Angmagssalik and Reykjavik during the second international Polar Year.] *Beiträge zur Physik der freien Atmosphäre*, 23(1):39–44, **1936.** tables. **DWB**—Mean winds up to 9.5 km for Angmagssalik and 5.5 km for Reykjavik from pilot balloon observations made during summer months. Wind directions indicate relatively high pressure over Greenland. Effect decreases with height. *Subject Headings:* **1. Upper air winds 2. Iceland 3. Greenland.**—*G.J.E.*

4E–80 551.506.7(47)

Bushev, I., **Aerologicheskaia kharakteristika Sverdlovska.** [Aerological characteristics of Sverdlovsk.] (In: Sverdlovsk, U.S.S.R. Magnitnaia i Meteorologicheskaia Observatoriia, **Iubileĭnyĭ Sbornik, 1836–1936.** Sverdlovsk, Upravlenie Gidrometsluzhby, **1936.** p. 227–253. 12 tables, 4 figs. English summary, p. 252–253.) **DLC**—Work is divided into a section of the vertical temperature distribution shown by kite ascents and a survey of results of some 847 pilot balloon ascents. Analysis extends to 3 km only. *Subject Headings:* **1. Upper air data 2. Sverdlovsk, U.S.S.R.**—*G.J.E.*

4E–81 551.557(51)

Chu, V. Y., **The upper air current observations over Nanking.** *Meteorological Magazine*, Nanking, 12:20–30, **1936.** 5 plates, 10 tables. In Chinese. **DWB**—Includes several graphs of velocities and tables of seasonal upper wind frequencies and speeds from various directions at 1 km intervals up to 10 km. *Subject Headings:* **1. Upper air winds 2. Nanking, China.**—*G.J.E.*

4E–82 551.557.36(548.7)

Dassanayake, D. T. E., **Pilot balloon observations at Colombo, 1922–1934.** *Ceylon Journal of Science, Sec. E*, Colombo, 2(1):1–26, **1936.** 40 pls., 5 tables. **DLC**—Expansion of earlier work by Bamford including observations at all heights up to 10 km, 6500 ascents. Monthly percentage frequencies of wind directions tabulated up to 5 km, and actual frequencies tabulated between 6 and 10 km. Average wind speeds (scalar) given up to 5 km. Wind roses show morning and afternoon frequencies to 10 km for each month. *Subject Headings:* **1. Upper air wind frequencies 2. Colombo, Ceylon.**—*G.J.E.*

4E–83 551.557

Durward, J., **Upper winds at Wadi Halfa (Sudan).** *Great Britain. Meteorological Office, Professional Notes*, No. 72, **1936.** 11 p. 12 figs., 6 tables, 3 refs. **DWB**—A year's observations of upper air winds at Wadi Halfa summarized in discussion and tables. *Subject Headings:* **1. Upper air winds 2. Wadi Halfa, Sudan.**—*H.P.K.*

4E–84 551.557(661)

Hubert, H., **Sur les limites des courants aériens dans l'Afrique de l'Ouest.** [On the limits of upper air currents in West Africa.] *Académie des Sciences, Paris, Comptes Rendus*, 202:1695–1697, May 18, **1936. DWB**—Author discusses limits of trade wind, monsoon, equatorial current and counter-trades, as observed by ascents made at stations between Brazzaville (4°17′S) and Tamanrasset (22°47′N). *Subject Headings:* **1. Upper air winds 2. Atmospheric circulation 3. West Africa.**—*G.J.E.*

4E–85 551.506.7(268,98)

Leningrad. Arkticheskiĭ Nauchno-issledovatel'skiĭ Institut, **Aerologicheskie nabliudeniia poliarnykh stantsiĭ za zimovku 1933-1934 Goda. Aerological observations of the polar stations during the winter of 1933–1934.** *Leningrad. Arkticheskiĭ Nauchno-issledovatel'skiĭ Institut, Trudy*, 69, **1936.** 111 p. In Russian. English translations of titles and table headings. **DLC**—Details of individual pilot balloon ascents given for heights up to 10 km (p. 14–81) followed by temperature observations (kite and radiosonde, p. 84–98) and surface observations (p. 102–111). Pilot balloon observations given for Calm Bay, Cape Zhelanyi, Matochkin Strait, Yugor Strait, Dickson Island, Cape Chelyuskin, Tixi Bay and Uelen. *Subject Headings:* **1. Upper air data 2. Arctic.**—*G.J.E.*

4E–86 551.557.36(73/9)

*Stevens, L. A., **Winds in the upper troposphere and the lower stratosphere over the United States.** *Monthly Weather Review, Supplement*, No. 36, **1936.** 29 p. 28 figs., 8 tables. **DWB**—Comprehensive survey of wind observations between 6 and 14 km. Wind roses given for 6, 8, 10 and 12 km for each season and for 14 km in addition for summer and autumn. Annual roses and seasonal and annual resultant winds also given. Frequency tables included for various quadrants and velocities. Table 8 gives extreme velocities recorded at each height by almost 100 stations during each season. *Subject Headings:* **1. Upper air wind frequencies 2. Upper air wind roses 3. Stratospheric winds 4. United States.**—*G.J.E.*

1937

4E–87 551.515.11

Bjerknes, J. and Palmén, Erik, **Investigations of selected European cyclones by means of serial ascents.** *Geofysiske Publikasjoner*, Oslo, 12(2), **1937.** 62 p. **DWB**—Detailed analysis of situation over western Europe between Feb. 15–17, 1935. Geostrophic winds on 400 mb map show value of 130 m/sec over Zeeland. *Subject Headings:* **1. Cyclone structure 2. Geostrophic winds 3. Jet stream 4. Western Europe.**—*G.J.E.*

4E–88 551.513 551.557

Brooks, C. E. P., **Studies on the mean atmospheric circulation.** *American Meteorological Society, Bulletin*, 18(10):313–322, Oct. **1937.** 22 refs. Reprinted with additions from *Meteorological Magazine*, London, 71:105–110, 177-183, **1936. DWB**—Discusses mean circulation at sea level, then proceeds to a consideration of the upper air. Diagrams drawn in form of a series of north-south sections of the atmosphere showing seasonal wind distributions up to 10 km. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds.**—*G.J.E.*

4E–89 551.553.6 551.557.36

*Great Britain. Meteorological Office, **Monthly normals of percentage frequencies of surface and upper winds over Malta, Egypt, Palestine, Trans-Jordan and Iraq, mainly between the years 1921 and 1932.** London, **1937.** 49 p. extensive tables. M.O. 405. **DWB**—Tables give monthly summaries of percentage frequencies of winds of various speeds and directions at the surface and at selected heights in the upper air, as observed in these countries. (*Same item as* 2J–181, Oct. 1951, *MAB.*) *Subject Headings:* **1. Upper air wind data 2. Malta 3. Egypt 4. Palestine 5. Trans-Jordan 6. Iraq.**—*H.P.K.*

4E–90 551.582(266,265,5)

Great Britain. Meteorological Office, **Weather in the China Seas and in the western part of the North Pacific Ocean. Volume II. Local information.** London, H.M.S.O. **1937.** 771 p. 211 figs., 43 tables, 207 refs. **DWB**—Handbook primarily for naval use. Vol. II subdivided

eographically into 11 parts dealing separately with various climatological elements including upper ind distribution. Upper wind frequency tables and wind roses given for each month or season for elected stations or areas. Most cases not extended above 15,000 ft. Some figures based on the nly available data. *Subject Headings:* **1. Climatology 2. Upper air winds 3. China Sea 4. Western Pacific.**—*G.J.E.*

4E–91 551.506.5(712)

*International Polar Year Commission. British National Committee for the Polar Year. **British Polar Year Expedition, Fort Rae, N.W. Canada 1932–33. Vol. 1. Discussion of results. Meteorology, Terrestrial Magnetism and Aurora, Atmospheric Electricity. Vol. II. Tables. Meteorology, Terrestrial Magnetism and Atmospheric Electricity.** London, Royal Society, **1937.** . 1. 336 p. 78 figs., 198 tables. v. II. 228 p. 287 tables. **MH-BH, DSI, NN**—Complete bservational program maintained at Fort Rae, June 1932–August 31, 1933. Pilot balloon scents and other data thoroughly analyzed and discussed in detail in Vol. I. Frequencies, mean irections and speeds given for levels up to 20,000 ft or 6 km. Individual ascents and mean monthly nd seasonal values of wind speeds at different levels included in Vol. II. *Subject Headings:* **1. Exeditions 2. Upper air wind data 3. Northwest Territories, Canada. I. British Polar Year Exedition to Fort Rae, N.W. Canada, 1932–33.**—*G.J.E.*

4E–92 551.506.7(673)

*Luanda, Angola. Observatório Meteorológico e Magnético "João Capelo," **Velocidade e ireccaõ do vento a diferentes alturas deduzidas das sondagens aerológicas por balões pilotos, Dec. 932–1936.** [Velocity and direction of the wind at different heights deduced from pilot balloon oundings, 1932–1936.] Luanda [1933–1937]. **GB-MO**—Results of individual pilot balloon scents tabulated and monthly ascents bound together to give a yearly volume. Very few ascents xceeded 4 km in any one year. *Subject Headings:* **1. Upper air wind data 2. Luanda, Southwest frica.**—*G.J.E.*

4E–93 551.506.7(438)

Poland. Państwowy Instytut Meteorologiczny, **Wyniki sondowań aerologicznych.** [Results f aerological soundings.] Warsaw, **1937. GB-MO**—Monthly series containing records of inividual soundings by balloons-sondes, aircraft and pilot balloons from various stations. Results f upper wind observations given up to 5 km. *Subject Headings:* **1. Upper air data 2. Upper air ind observations 3. Poland.**—*G.J.E.*

4E–94 551.557.36(729)

*Proud, S., **Upper winds at Kingston, Jamaica.** *Great Britain. Meteorological Office, Professional Notes*, No. 78, **1937.** 26 p. 7 plates, 8 figs., 18 tables, 6 refs. M.O. 336r. **DWB**—Based on pilot alloon observations, 1925 to 1936, monthly frequency tables and wind roses given up to 10 km. Tables also given of frequency of height of counter-trades in ascents reaching to at least 9 km, of esults from ascents exceeding 15 km, and of mean monthly wind speeds at heights up to 10 km. *ubject Headings:* **1. Upper air wind frequencies 2. Kingston, Jamaica.**—*G.J.E.*

4E–95 551.508.7(438)

*Vilna. Observatorium Astronomiczne, **Rezultaty pomiarow wiatrow gornych w roku 1928 . . . 936 w Wilnie.** [Upper wind observations made at Vilna in the period 1928 . . . 1936.] *Vilna. Observatorium Astronomiczne, Biuletyn, II, Meteorologie*, Nos. 6–13, **1928–1937. DLC**—Individual ilot balloon ascent data tabulated. No summaries. Each bulletin contains ascents for approximately one year periods. *Subject Headings:* **1. Upper air wind data 2. Vilna, Lithuania.**—*G.J.E.*

4E–96 551.557.36

*Wei, Yuen-Hen, **A study of the upper air circulation over central China by means of pilot balloons.** *Meteorological Magazine*, Nanking, 13:171–172, **1937.** 10 figs., tables p. 193–232. English bstract p. 171. **DWB**—Tables give seasonal and annual frequencies of winds from various directions, and average speeds of these winds between surface and 5 km for Sian, Nanking and Tsingtao. *ubject Headings:* **1. Upper air wind frequencies 2. China.**—*G.J.E.*

4E–97 551.506.7(51)

Zi-ka-wei, China. Observatoire, **Bulletin Aérologique, No. 1–13. Jan.–June 1931.** Zi-ka-wei, an.–June **1937. GB-MO**—Details of individual pilot balloon ascents given for Zi-ka-wei and Hankow. Supplement gives soundings made on U.S.S. Houston during Feb. 1932–Oct. 1932. In 933 observations for Tsingtao were included, and in 1934 observations for Peiping. *Subject Headngs:* **1. Upper air wind observations 2. China.**—*G.J.E.*

1938

4E–98 551.557(564)

*Durward, J., **Upper winds at Nicosia (Cyprus).** *Great Britain. Meteorological Office, Professional Notes*, (87), **1938.** 12 p. 12 figs., 10 tables. **NNA**—Results of observations for two years, 1934–1935, at varying altitudes for each month tabulated and discussed. Charts show constancy and direction of wind at different heights. (*Same item as* 2F–129, May 1951, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Cyprus.**—*H.P.K.*

4E–99 551.506.7(96) 571.557.36

*Giovannelli, J. L., **Quatre années de sondages aérologiques en Océanie.** [Four years of aerological soundings in French Oceania.] *Annales de Physique du Globe de la France d'Outre-mer*, 5(28):102–103, 109–113, Aug. **1938.** 3 tables, charts, figs. **DLC**—Monthly upper wind distribution in 1936 discussed. Tables give annual percentage frequencies of wind directions up to 10 km for 1934–1937. Diagrams show air currents between surface and 10 km for 1936 and 1937. *Subject Headings:* **1. Upper air wind frequencies 2. Wind roses 3. French Oceania.**—*G.J.E.*

4E–100 551.557.2(672)

Gouault, J., **Vents en altitude à Fort-Lamy (Tchad).** [Upper winds at Fort Lamy (Chad).] *Annales de Physique du Globe de la France d'Outre-Mer*, 5(27):70–72, 82–91, June **1938.** graphs, charts. **DLC**—Graphs show monthly results of surface and upper wind, pressure, vapor pressure, and temperature measurements, April 1936–March 1937. Wind arrows show winds observed during each ascent. Seasonal values and distribution of mean speed discussed, maximum being observed between 10 and 12 km with little change up to 15 km. *Subject Headings:* **1. Upper air observations 2. Upper air wind variations 3. Fort Lamy, French Equatorial Africa.**—*G.J.E.*

4E–101 551.506.2:551.557.2(43)

*Keil, Karl, **Die Höhenwindverhältnisse über Deutschland während des Polarjahres 1932–1933.** [The upper winds over Germany during the Polar Year 1932–1933.] *Beiträge zur Physik der freien Atmosphäre*, Leipzig, 24:290–301, **1938.** 7 figs., 6 tables. **DLC**—Mean seasonal and annual wind speeds (scalar) tabulated for more than twenty stations for levels up to 5 km. Polar year values then compared with long period means for Lindenberg, Friedrichshafen, Berlin and Königsberg. *Subject Headings:* **1. Upper air winds 2. International Polar Year, 1932–1933 3. Germany.**—*G.J.E.*

4E–102 551.557 551.591

Larsen, L. N., **Visibility and upper winds at Auckland, Wellington and Christchurch.** *New Zealand. Meteorological Office, Note*, No. 20, **1938.** 27 p. 6 figs., 18 tables. **DLC**—Observational data for Auckland 1929–1931, for Christchurch, 1930–1935 and for Wellington 1929–1935 for heights to 3 km. Figure shows variation with height of mean component velocities from N, S, E, and W, between surface and 16 km, but these were considered unreliable above 9 kms. (*Same item as* 4D–91, April 1943, *MAB.*) *Subject Headings:* **1. Visibility data 2. Upper air wind data 3. New Zealand.**—*G.J.E.*

4E–103 551.506.1(469.9) 551.557

Portugal. Serviço Meteorológico Nacional. Divisaõ Regional dos Açores, **Resumé d'observations de 1926–1935.** [Summary of observations.] Lisbon, **1928–1938. GB-MO**—Annual series giving details of individual pilot balloon ascents at Angra do Heroismo up to 7 km. No summaries included. *Subject Headings:* **1. Yearbooks 2. Upper air wind frequencies 3. Azores.**—*G.J.E.*

4E–104 551.58:629.13

Treloar, H. M., Newman, B. W. and Newell, H. F., **Weather conditions affecting aviation over the Tasman Sea. Pt. 3. Winds in the free atmosphere.** *Australia. Meteorological Branch, Bulletin*, No. 25, **1938.** 23 p. 9 figs., 11 charts, 19 tables. **NNA**—Consists of three sections: 1) The effect of winds on times of flight, 2) Occasions of large increases of wind with height and 3) Wind velocities in the 5 km level. Data and methods employed are discussed, followed by deductions regarding times of crossings of the Tasman Sea, large increases of wind with height, and winds at 16,000 ft. (*Same item as* 4D–98, April 1953, *MAB.*) *Subject Headings:* **1. Aeronautical climatology 2. Upper air winds 3. Tasman Sea.**—*H.P.K.*

1939

4E–105 551.510.5 551.547 551.557

Barbe, G., **Les conditions météorologiques dans la haute troposphère (à 5000 m et au-dessus) considérées en vue de la navigation aérienne.** [Meteorological conditions in the high troposphere (at 5000 m and above) considered from the standpoint of aerial navigation.] *Groupement Français*

pour le Developpement des Recherches Aéronautiques, Paris, Rapport Technique, No. 1, **1939.** 30 p.—**DWB**—Considers mean wind data and includes isobaric map for July for Northern Hemisphere at 8000 meters. Special synoptic occasions studied and isobars drawn over Western Europe at sea level, 2000 and 5000 meters. *Subject Headings:* **1. Aerial navigation 2. Upper air wind data.**—*G.J.E.*

4E–106 551.543:551.557.36(96)

Giovannelli, J. L., **Les courants aériens et la pression atmosphérique en Océanie Française.** [Upper air currents and atmospheric pressure in French Oceania.] *Annales de Physique du Globe de la France d'Outre-mer*, 6(36):168, 174–191, Dec. **1939.** 5 tables, 9 charts, 15 refs. **DLC**—Annual and short term variations of surface pressure and upper winds compared from 1935–1938 observations made at Tahiti. Statistics given for wind direction variations; frequency of wind directions; frequency of wind speeds up to 10 km. *Subject Headings:* **1. Pressure variations 2. Upper air wind frequencies 3. Tahiti, French Oceania.**—*G.J.E.*

4E–107 551.506.5(99)

Grimminger, George and Haines, W. C., **Meteorological results of the Byrd Antarctic Expeditions, 1928–30, 1933–35: tables.** *Monthly Weather Review, Supplement*, No. 41, **1939.** 377+p. 7 figs., 39 tables. **DWB**—Upper air observations are included in tables 26 and 27. Table 26 includes a few winds aloft observations. Table 27 gives details of individual ascents made at Little America, Jan. 1929–Feb. 1930 and March 1934–Feb. 1935. *Subject Headings:* **1. Byrd Antarctic Expedition 2. Upper air wind data 3. Antarctica.**—*G.J.E.*

4E–108 551.506.5 551.506.7(988)

Holzapfel, Rupert, Kopp, W. and Wegener, K., **Wissenschaftliche Ergebnisse der Deutschen Grönland-Expedition Alfred Wegener 1929 and 1930/31. Band IV. Meteorologie. 2. Halbband: Die Ergebnisse.** [Scientific results of the Alfred Wegener German Greenland expedition, 1929 and 1930/31. Vol. IV. Meteorology, Pt. 2. Results.] Leipzig, **1939.** 380 p. **DWB**—Tables and figures of upper wind observations up to 8 km and above made at the Oststation (Kolonie), Oststation (Nordost-Bucht) and at Weststation. *Subject Headings:* **1. Upper air wind observations 2. Arctic expeditions 3. Wegener Greenland Expedition, 1929, 1930/31 4. Greenland.**

4E–109 551.506.7

*International Aerological Commission. International Polar Year 1932–33, **Results of aerological ascents on international days.** Berlin, **1936–1939.** 16 v. **GB-MO**—Upper air observations include wind direction and speed at 500 m intervals up to 5 km, and at 1 km intervals to greater heights. *Subject Headings:* **1. Upper air observations 2. Upper air wind data.**—*G.J.E.*

4E–110 551.506.5(988) 551.506.7

*MacGregor, Clifford J., **The MacGregor Arctic expedition to Etah, Greenland, July 1, 1937 to October 4, 1938.** *Monthly Weather Review*, 67(10):366–382, Oct., **1939.** tables. **DWB**—Full details given of 341 pilot balloon observations up to 9 km made between Sept. 10, 1937 to June 30, 1938. Seasonal wind roses prepared for levels with 20 observations or more. Resultant winds also given for those levels. *Subject Headings:* **1. Arctic expeditions 2. Upper air wind observations 3. Etah, Greenland.**—*G.J.E.*

4E–111 551.513 551.587(54)

Ramanathan, K. R. and Ramakrishnan, K. P., **The general circulation of the atmosphere over India and its neighbourhood.** *India. Meteorological Dept., Memoirs*, 26(10):189–245, **1939.** 74 plates. **DWB**—Describes main features of upper wind and temperature distribution in each month and relates them to predominating features of climate. Charts appended for each month showing mean air flow up to 8 km. Another appendix gives monthly normal upper winds to same height for 34 stations. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds. 3. India.**—*G.J.E.*

4E–112 551.513:551.557(8)

Serra, Adalberto B., **La circulation générale de l'Amérique de Sud.** [The general circulation of South America.] Rio de Janeiro, Serviço Nacional de Meteorología, **1939.** 17 p. numerous charts and graphs. **DWB**—Survey of all available upper wind observations to 30,000 m. Charts of South America show Jan. and July circulation to 12 km. Other charts give wind roses for levels up to 5 km and direction and velocity of mean monthly winds to 12 km. Wind variation with height shown for 24 stations for Jan. and July. Seasonal wind roses are extended up to 30 km. Notes preface the charts. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds 3. South America.**—*G.J.E.*

4E–113 551.557(83)

Valenzuela del Río, J., **Le vent à diverses hauteurs au dessus de Santiago.** [The wind at various heights above Santiago.] *International Meteorological Organization, Pub.* 41, **1939.** **DWB**—Mean wind speeds up to 7 km appended. Values given for each month. *Subject Headings:* **1. Upper air winds 2. Santiago, Chile.**—*G.J.E.*

1940

4E–114 551.506.7(65):551.557.36

*Algiers. Université. Institut de Météorologie et de Physique du Globe, **Annuaire, Algérie au Nord du 32ème parallèle 1938, 1939.** [Yearbook. Algeria north of the 32nd parallel.] Algiers, **1938, 1940.** **GB-MO**—Percentage frequencies of wind directions observed each month at Algiers to height of 6 km. Later yearbooks do not include these observations, which ceased in June 1939. *Subject Headings:* **1. Upper air wind frequencies 2. Algeria.**—*G.J.E.*

4E–115 551.506.5(71)

Canada. Meteorological Div., **Canadian Polar Year Expeditions 1932–33,** v. 1. **Meteorology. Cape Hope's Advance, Chesterfield Inlet, Coppermine, Meanook.** Ottawa, **1940.** 452 p. 7 maps, 46 pls., tables. **GB-MO**—Record of work of the expeditions containing tables of individual pilot balloon observations at all four stations. Data given where available up to 14 km. *Subject Headings:* **1. Pilot balloon observations 2. Expeditions 3. Canadian Arctic.**—*G.J.E.*

4E–116 551.557.2(914)

Depperman, C. E., **Upper air circulation (1–6 km.) over the Philippines and adjacent regions.** Manila, Weather Bureau, **1940.** 85 p. numerous figs., 31 refs. **DWB**—Monthly upper air circulation analyzed. Six main air streams are diagnosed. Charts show mean extent, direction and force up to 6 km for each. Possible influences of the air streams on growth and tracks of typhoons discussed. *Subject Headings:* **1. Upper air circulation 2. Typhoons 3. Philippine Islands.**—*G.J.E.*

4E–117 551.547 551.557(73/9)

Ekhart, Erwin, **Zum Klima der freien Atmosphäre über U.S.A. III. Die Luftdruck- und Windverhältnisse.** [The climate of the free air over U.S.A. III. Pressure and winds.] *Beiträge zur Physik der freien Atmosphäre,* 26(4):211–242, **1940.** 8 figs., 3 tables, 16 refs. **DLC**—Pressure and wind distributions studied to 5 km. Mean pressure gradients over North America and Central Europe compared. Principal features of contour maps and mean upper winds are considered. *Subject Headings:* **1. Upper air pressure 2. Upper air winds 3. United States.**—*G.J.E.*

4E–118 551.501.7:551.557(43)

†Graf, F., **Untersuchungen über die Höhenwindverhältnisse benachbarter aerologischer Stationen.** [Investigations on upper wind conditions of adjacent aerological stations.] *Berlin. Universität, Meteorologisches Institut, Veröffentlichungen,* 3(6), **1940.** 93 p. figs., tables, charts, 43 refs. **DWB**—Considers pilot balloon ascents up to 5 km at: a) Hamburg, Hannover and Bremen in the NW and b) Dresden, Breslau and Gleiwitz in the SE. Discusses differences between pairs of stations in same region. Examines discontinuities and, finally, considers possibility of determining upper wind field (a) from high level pressure charts, (b) from surface weather charts. *Subject Headings:* **1. Upper air winds 2. Upper air analysis 3. Germany.**—*G.J.E.*

1941

4E–119 551.513:551.557(6)

Ekhart, Erwin, **Die Strömung der Luft über Afrika und den angrenzenden Gebieten; ein Beitrag zur Kenntnis der allgemeinen Zirkulation.** [Air currents over Africa and the neighboring regions; a contribution to the knowledge of the general circulation.] *Germany. Reichsamt für Wetterdienst, Forschung und Erfahrungsberichte, Ser. A,* No. 10, **1941.** 48 p. 30 figs., 6 tables, 90 refs. **DWB**—General atmospheric circulation over Africa studied. Clear picture of wind flow conditions, winter and summer, derived from upper air wind observations. Mean wind flow charts to heights of 8 or 10 km constructed by means of graphs and cross sections of zonal and meridional components. Horizontal temperature changes inferred from vertical wind changes. Author considers the characteristic parts played by the harmattan, trades, antitrades and monsoons, their effects and season of occurrence. Details of associated sandstorms discussed. A brief survey of aeronautical climatological applications included. (*Same item as* 3H-141, Aug. 1952, *MAB.*) *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds 3. Africa.**—*G.J.E.*

4E–120 551.557.36(661)

*French West Africa. Service Météorologique, **Vent en altitude.** [Upper winds.] *French West Africa. Service Météorologique, Memento,* No. 8, **1941.** 216 p. of tables. **DWB**—Frequencies

calculated for levels up to 4 km at 18 stations, based on ascents made between 1936 and 1938 or 1938 and 1940. Monthly frequencies given for winds from eight directions between specified speed limits. *Subject Headings:* **1. Upper air wind frequencies 2. French West Africa.**—*G.J.E.*

4E–121 551.506.5(99)

*Grimminger, George, **Meteorological results of the Byrd Antarctic Expeditions, 1928–30, 1933–35; Summaries of data.** *Monthly Weather Review, Supplement*, No. 42, **1941.** 106+p. 76 tables, 125 figs., 7 refs. **DWB**—Observational data from Supplement No. 41 (*see item* 4E–107 above) summarized and analyzed. Monthly pilot balloon wind data give resultant directions, resultant and mean speeds, and resultant components of velocity at each level. Uppermost levels vary between 6 km and 13 km. Data combined to give percentage frequencies of wind directions at standard levels by season and year. Mean velocities with different wind directions given for light and dark seasons and for year. Mean turning of the wind given for winds with different surface directions. Figures show vertical distribution for seasons and year. Other tables show results of pilot balloon ascents made under differing synoptic conditions. *Subject Headings:* **1. Byrd Antarctic Expedition 2. Upper air wind data 3. Antarctica.**—*G.J.E.*

4E–122 551.576.11:551.557(42):629.13

Horrocks, H., **Notes on the upper air ascents at Boscombe Down and the upper winds at Larkhill and Liverpool.** *Great Britain. Aeroplane and Armament Experimental Establishment, Boscombe Down, High Altitude Development, Flight Report* No. 16, Oct. **1941.** 20+p. 19 figs., 15 tables. **NJP**—Report of 69 special ascents to 40,000 ft at Boscombe Down. All trails due to condensation of exhaust water. Relations of trails to cirrus, the synoptic situation, humidity, bumpiness and lapse rate are described. Persistent trails not formed more than 1500 ft above tropopause. Good deal of information included on strong upper winds and changes of wind with height, time and distance. There are close-up photos of trails. (For fuller abstract *see* 2I–74, Sept. 1951, *MAB.*) *Subject Headings:* **1. Condensation trails 2. Exhaust trails 3. Upper air winds 4. Tropopause 5. England.**—*C.E.P.B.*

4E–123 551.513:551.557(51)

Yang, C. C., **The upper air currents over southern Szechuan, China.** *Meteorological Magazine*, Nanking, 15:165–170, **1941.** 5 tables. In Chinese, English abstract p. 165. **DWB**—Main seasonal changes in air flow investigated. Below 6 km mean velocity is lower than at Nanking. Mean speeds given to height of 7 km. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds 3. Szechuan, China.**—*G.J.E.*

1942

4E–124 551.5(058) 551.557(83)

*Chile. Oficina Meteorológico de Chile, **Anuario meteorológico de Chile, 1933–1941.** Santiago de Chile, **1935–1942. GB-MO**—Section devoted to summary of pilot balloon observations at Santiago. Frequencies given for each month of winds from different directions and with speeds within specified values at levels up to 5 km or above. In 1937 volume frequencies and mean speeds given up to 7 km. Observations omitted in 1938, but in 1939 monthly data are given for varying periods for Antofagasta, Vallenar, Los Cerrillos and Santiago. 1940 includes monthly data for La Chamiza and Punta Arenas and 1941, data for occasions of strong winds at 6 km to 13 km with speed and direction given at 1 km intervals. *Subject Headings:* **1. Yearbooks 2. Upper air wind data 3. Chile.**—*G.J.E.*

4E–125 551.557(569)

*Frankel, Morris H., **Upper air data for selected stations in Iraq.** *U. S. Weather Bureau, Special Report*, No. 142, **1942.** *U. S. Army Air Forces, Report* No. 205. 19 p. tables. **DWB**—Values for percentage frequency by directions and by velocity groups for different altitudes, tabulated for Mosul, Rutbash, Shaibash, and Hinaidi, Iraq, for period from 1922–1932. (*Same item as* 2F–155, June 1951, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Iraq.**

4E–126 551.513 551.557

Stone, Robert G., **On the mean circulation of the atmosphere over the Caribbean.** *American Meteorological Society, Bulletin*, 23(1):4–16, Jan. **1942.** 7 figs., 2 tables. **DWB**—Author uses San Juan, P. R., pilot balloon and cloud observations as basis for discussion of trade and anti-trade winds and transitional layer between them. Diagram shows resultant winds for each month from surface to 12 km at 1 km intervals computed from pilot balloon observations, 1926–31. Similar figure gives resultant winds from 8 km to 16 km from observations made between 1920 and 1938. Table shows the prevailing directions of lower, intermediate and upper clouds. Discrepancy between

these directions and the resultant winds considered to be mainly caused by winds aloft having more southerly component than the average when conditions are favorable for formation of upper clouds. *Subject Headings:* **1. Trade winds 2. Atmospheric circulation 3. Upper air winds 4. Caribbean Sea.**—*G.J.E.*

4E–127 551.509.2(7)

U. S. Weather Bureau, **Historical weather maps, Daily synoptic series, North America—10 kms., 1940–[42]; . . . 16 kms., 1940–[42].** Washington [1942]. **DWB**—Maps showing isobars and isotherms, issued monthly, based primarily upon radiosonde observations and secondarily upon pilot balloon observations. Isobars are drawn for 5, 3 and 2 mb intervals on the 10, 13 and 16 km maps, respectively. Wind arrows shown on each map as dashed lines are for level 1 km below the level of the map. *Subject Headings:* **1. Upper air pressure 2. Upper air winds 3. North America.**—*G.J.E.*

1943

4E–128 551.506.2 551.506.7(493)

Dufour, Louis, **Étude statistique des observations aérologiques d'Uccle pendant l'année polaire 1932–33.** [Statistical studies of aerological observations at Uccle during the polar year 1932–33.] *Belgium. Institut Royal Météorologique, Miscellanées*, Fasc. 14:1–13, **1943.** 5 tables, 4 figs. **DWB**—Daily upper air temperature, humidity and wind observations at Uccle during the polar year analyzed. Tables and figures give monthly mean scalar wind speeds for levels up to 5 km, and mean vector wind speeds and direction. *Subject Headings:* **1. Upper air wind observations 2. Uccle, Belgium.**—*G.J.E.*

4E–129 551.557.36

Jansá Guardiola, José María, **Notas para una climatología de Menorca (Islas Baleares). Vientos en altura.** [Notes on the climate of Minorca (Balearic Islands). Winds aloft.] *Spain. Servicio Meteorológico Nacional, Publicación, Ser. A*, No. 12, **1943.** 49 p. figs., tables. German summary p. 5. **DWB**—Wind aloft data from pilot balloon soundings up to 8 km summarized in tables and graphs for seasons and year. Frequency of cloud heights and types also tabulated for 3 times a day. The monograph is devoted chiefly to large, detailed upper air wind roses (direction and speed separate). Brief discussion. (*Same item as* 2.11–120, Nov. 1951, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Cloud height 3. Minorca, Balearic Islands.**—*M.R.*

4E–130 551.506.5:551.557(265,266)

Thomson, A., **Scientific results of the Cruise VII of the "Carnegie" 1928–29 under command of Capt. J. P. Ault. Meteorology II. Upper wind observations and results obtained in Cruise VII of the "Carnegie."** *Carnegie Institution of Washington, Publication* 547, **1943.** 93 p. 46 figs., 8 tables, 6 refs. **DWB**—General circulation over tropical regions of Pacific discussed. Results of pilot balloon ascents over Pacific tabulated. Component and resultant velocities measured in specified areas to heights up to 6.5 km and upper wind components obtained on each ascent. Figures give wind directions and speeds observed at various heights, occasionally reaching 9 km. *Subject Headings:* **1. Upper air wind data 2. "Carnegie" Expedition, 1928–1929 3. Pacific Ocean.**—*G.J.E.*

4E–131 551.58:629.13 551.557.36(67)

*U. S. Weather Bureau, **Weather summary, East Central Africa (including Zanzibar and Seychelles Islands), for use with Naval Air Pilot.** *U. S. Hydrographic Office, Supplement B* to H.O. No. 263, **1943.** 158+p. tables, 39 charts. **DWB**—Section deals with upper air winds. Short notes given on upper winds over the area. Resultant winds, percentage frequencies of winds from each direction and for different velocity groups and wind roses given for various levels for each season and station. Only at Kabete (Kenya) did these heights exceed 20,000 ft. *Subject Headings:* **1. Aeronautical climatology 2. Upper air wind frequencies.**—*G.J.E.*

1944

4E–132 551.58:629.13

*Australia. Royal Australian Air Force. Meteorological Services, **Weather on the Australia Station. Volume II. Local information.** *Australia. R.A.A.F. Publication*, 252, Cover A, Pts. 1–6, **1942.** Cover B, Pts. 7–12, **1944.** Parts paged separately. numerous tables, figs., refs. **GB-MO**—Area covered by individual parts includes Bismarck Archipelago, Coral Sea, Pacific Ocean from equator to Antarctic between 80°E and 170°E, and southern sections of Indian Ocean. The various elements are dealt with in detail in each part and appended climatological tables include upper air seasonal wind roses generally up to 16,000 ft. Notes frequently included on winds at higher levels. *Subject Headings:* **1. Aeronautical climatology 2. Upper air wind roses 3. Australia 4. South Pacific Ocean 5. Indian Ocean.**—*G.J.E.*

4E–133 551.58:629.13 551.557.36(798)

*U. S. Weather Bureau, **Weather summary, Alaska area, for use with Naval Air Pilot.** *U. S. Hydrographic Office, H.O.*, 526, **1944.** 279 p. tables, charts. **DWB**—Section devoted to upper air data includes wind roses, resultant winds and percentage frequencies of winds from each direction and for different velocity groups at various levels for each season and station. Values for Fairbanks and Nome extend up to 26,000 ft and for Juneau up to 32,800 ft. For similar study and data on Guam, Laoang and Wake Island in W. Pacific see *Ibid.* H.O. 273, 1943. *Subject Headings:* **1. Aeronautical climatology 2. Upper air wind frequencies 3. Alaska 4. Caroline Islands 5. Marshall Islands.**—*G.J.E.*

4E–134 551.58:629.13 551.557.36(969)

*U. S. Weather Bureau, **Weather summary, Central Pacific, Hawaiian Islands area, for use with Naval Air Pilot.** *U. S. Hydrographic Office, H.O.*, W-270, **1944.** 182 p. tables. **DWB**—Wind roses for each season given for Canton Island, Midway Island, and Wake Island to 26,200 ft, and for Pearl Harbor to 32,800 ft. Resultant winds, percentage frequency of winds from each direction for different velocity groups, and average velocity for each direction given where available up to 32,800 ft. For similar study and data on Apia, Canton Island, Jarvis Island and Papeete in S. Pacific see *Ibid., H.O.*, W-271, 1944. *Subject Headings:* **1. Aeronautical climatology 2. Upper air wind frequencies 3. Hawaiian Islands 4. South Pacific Islands.**—*G.J.E.*

4E–135 551.557(46)

*Vidal Llenas, José M. and Potau Gili, M., **Vientos en altura en Barcelona.** [Winds aloft at Barcelona.] *Spain. Servicio Meteorológico Nacional, Publicación, Ser. D*, No. 3, **1944.** 30 p. 46 figs., 41 tables, 6 refs. **DWB**—Analysis of direction and velocity of wind at elevations from 200 m to 12,000 m based upon 28,309 soundings and presented in monthly summaries, tabularly and graphically. (*Same item as* 2.11–119, Nov. 1951, *MAB.*) *Subject Headings:* **1. Upper air wind observations 2. Barcelona, Spain.**—*I.L.D.*

1945

4E–136 551.582(52)

Great Britain. Meteorological Office, **Meteorological report on the Ryukyu Islands.** *Great Britain. Meteorological Office, Aviation Meteorological Report*, No. 28, **1945.** 31 p. 11 pl., 9 tables, 5 append. M.O.M. 365/28. **GB-MO**—First part deals with synoptic meteorology of area and second part with various weather elements. Upper wind information based mainly on chart analysis as little data available. Mid-winter upper westerly winds occasionally exceed 200 knots above 20,000 ft. These begin to lessen in spring; very high speeds uncommon by June. Appendix II gives estimated monthly vector mean geostrophic winds above Naha at 33,000 ft, 20,000 ft and 10,000 ft derived from U. S. Weather Bureau "Normal weather maps, Northern Hemisphere, upper level." *Subject Headings:* **1. Aeronautical meteorology 2. Geostrophic winds 3. Naha, Japan 4. Ryukyu Islands.**—*G.J.E.*

4E–137 551.557.2

*U. S. Weather Bureau, **Atlas of monthly pilot charts of the upper air, North Atlantic and North Pacific Oceans.** *U. S. Hydrographic Office, Publication*, No. 560, **1945.** 12 leaves. 24 maps. **DLC**—Monthly charts for North Pacific and North Atlantic show isobars, isotherms, sea surface temperature, storms, gales, wind roses for ocean and coastal stations at surface, 2500, 5000 and 10,000 ft currents, magnetic variation, and air and sea routes. Prepared from Hydrographic Office and Weather Bureau data. *Subject Headings:* **1. Marine atlases 2. Upper air winds 3. North Pacific Ocean 4. North Atlantic Ocean.**—*M.P.K.*

4E–138 551.557(266)

U. S. Air Weather Service, **Average monthly wind velocities on routes from Hawaii to the west coast.** *U. S. Air Weather Service, Special Study*, No. 28, **1945.** 3 p. 36 plates. Mimeographed. **DWB**—Average monthly wind speed and direction derived from normal pressure maps, and presented on charts. Winds given at 5000 ft, 10,000 ft and 20,000 ft for 5° intervals of longtitude along routes. Winds predominantly westerly in upper levels. *Subject Headings:* **1. Upper air winds 2. Eastern Pacific Ocean.**—*G.J.E.*

1946

4E–139 551.501.7:551.557.36

Brooks, C. E. P., Durst, Charles S. and Carruthers, Nellie, **Upper winds over the world. Part I. The frequency distribution of winds at a point in the free air.** *Royal Meteorological Society, Quarterly Journal*, 72(311):55–73, Jan. **1946.** 10 tables, 2 refs. **DLC**—The authors, realizing the limitations

imposed by scanty observational data, present a method whereby, given the resultant direction and velocity of the wind at a point in the free air and some measure of the scatter of individual observations about the resultant, a wind rose can be constructed to show the frequency distribution of winds of different directions and velocities which would be given by a long series of observations. Thus, a "long term" distribution can be estimated at various levels for any station with a short but representative record. *Subject Headings:* **1. Upper air wind computation 2. Upper air wind frequencies 3. Upper air wind roses.**—*G.J.E.*

4E–140 551.557.36(676)

*East Africa High Commission. Meteorological Dept., **Upper wind frequencies. Tables of frequencies of the speed and direction of upper winds determined by pilot balloon observations at stations in British East Africa during the period 1927–43.** Nairobi, **1946.** 149 p. **DWB**—Tables give monthly frequencies at 500 m, 1000 m and thence at 1000 m intervals to 8000 m for high level stations, and at 10,000 m for sea level stations. Eight points of compass considered and frequencies given for speed intervals of 0–1.6 m/sec; 1.6–7.1 m/sec; 7.2–14.0 m/sec; 14.1–20.9 m/sec and speeds in excess of 20.9 m/sec. Frequencies given for two periods 0700–1500 G.M.T., and 1600–0600 G.M.T. to indicate extent of any diurnal variation. 25 stations considered. *Subject Headings:* **1. Upper air wind frequencies 2. British East Africa.**—*G.J.E.*

4E–141 551.58:629.13(55)

Great Britain. Meteorological Office, **Meteorological report for west Persia.** *Great Britain. Meteorological Office, Aviation Meteorological Report*, No. 33, **1946.** 34 p. 5 plates. M.O.M. 365/33. **GB-MO**—Emphasis on elements important to aviation. Upper wind data scarce and only available for those occasions when pilot balloons could be followed to a sufficient height. Table shows Jan., April, July and Oct. vector mean wind directions and speeds for levels between 10,000 and 25,000 ft for NW Persia and Khuzistan. *Subject Headings:* **1. Aviation climatology 2. Upper air wind data 3. Northwest Persia 4. Khuzistan, Iran.**—*G.J.E.*

4E–142 551.58:629.13

*Great Britain. Meteorological Office, **Meteorological report on the Ceylon to West Australia air route.** *Great Britain. Meteorological Office, Aviation Meteorological Report*, No. 32, **1946.** 36 p. 12 figs., 4 appends. M.O.M. 365/32. **GB-MO**—Based on pilot reports. Tables give wind frequencies for Cocos Island at levels up to 20,000 ft. Upper wind observations from aircraft in flight extend only to 12,000 ft. *Subject Headings:* **1. Aviation climatology 2. Upper air wind frequencies 3. Cocos Island 4. Indian Ocean.**—*G.J.E.*

4E–143 551.506.7(52)

Tateno, Japan. Aerological Observatory, **Bulletin. 1946. GB-MO**—Bulletin issued three times a month in Esperanto from 1927–1936 under title "Bulteno", with details of individual pilot balloon ascents. From 1946 Bulletin was issued monthly in English with detailed radiosonde, "Rawin" and "Rabal" observations. The "wind aloft" data generally extend to levels greater than 12 km. *Subject Headings:* **1. Upper air data 2. Upper air wind data.**—*G.J.E.*

4E–144 551.582(72)

*Vivó, Jorge A. and Gómez, José C., **Climatologia de Mexico.** [Climatology of Mexico.] *Instituto Panamericano de Geografía e Historia, Mexico, D. F., Publicación* 19, **1946.** 73 p. chiefly charts, figs., tables. **DWB**—Climatological treatise including section on upper winds showing seasonal wind direction charts for different levels up to 10 km. Diagrams show seasonal distribution of west and east winds between surface and 10 km along the 70°, 85°, 100° and 115° meridians and between latitudes 0° and 36°N. (*Same item as* 3.4–228, April 1952, *MAB.*) *Subject Headings:* **1. Climatic data 2. Upper air wind frequencies 3. Mexico.**—*G.J.E.*

1947

4E–145 551.506.7(471.1)

*Finland. Ilmatieteellinen Keskuslaitos, **Aerologiset Havinnot. 1944–1947. Die aerologischen Beobachtungen in den Jahren 1944–1947.** [Aerological observations, 1944–1947.] *Finland. Ilmatieteellinen Keskuslaitos, Suomen Meteorologinen Vuosikarja*, v. 44/45-46/47, Pt. 3, **1944–1947** (publ. 1951). 147–97 p. 2 pieces. Entirely tables, refs. In Finish and German. **DWB**—Data sources were the central meteorological institution for Finland and the defense authority. Tables show heights of different isobaric surfaces and temperature and relative humidity at each level for various radiosonde stations. Number and average height of ascents during different months recorded. Upper air wind velocity observations made with radiosondes and pibals. Numbers of

wind observations by months included. (*Same item as* 3.11–46, Nov. 1952, *MAB.*) *Subject Headings:* **1. Upper air wind data 2. Radiosonde data 3. Finland. I. Rossi, Veikko** (*ed.*).—*M.P.K.*

4E–146 551.513:551.557(57)

*Flohn, Hermann, **Grundzüge der atmosphärischen Zirkulation über Sibirien und dem angrenzenden Polarmeer.** [Characteristic features of the atmospheric circulation over Siberia and the adjoining Polar sea.] *Polarforschung*, Kiel, 2:143–149, **1947. DWB**—Upper air temperature distribution and mean circulation in summer and winter discussed with tables giving mean temperatures at levels up to 10 km for 13 stations and mean winds for 13 stations at the 5 km level and for 6 stations at the 10 km level. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds 3. Siberia.**—*G.J.E.*

4E–147 551.506.7(61)

*Koch, H. G., **Über Radiosondenmessungen in der Cyrenaika im Sommer 1942.** [Radiosonde observations in Cyrenaica in the summer of 1942.] *Zeitschrift für Meteorologie*, 1(13):385–392, Oct. **1947.** 8 tables, fig. **DWB**—June–Oct. 1942 upper wind results discussed in relation to general synoptic situation prevailing during period. Table 1 gives wind direction frequencies observed at El Daba (31°5′N, 28°28′E), at six levels up to 10 km. *Subject Headings:* **1. Upper air wind frequencies 2. Cirenaica, Libya.**—*G.J.E.*

4E–148 551.510.53 551.557(85)

*Korff, S. A. and Wagner, C. A., **Meteorología de la estratosfera en el Perú.** [Meteorology of the stratosphere above Peru.] *Revista Meteorológica*, Montevideo, 6(22):113–123, April, **1947.** 2 tables, 2 figs. **DWB**—Discussion of observed vertical distribution of temperature and humidity in relation to theoretical values. Direction and speed of upper winds briefly analyzed, based on ascents made at Lima. Table gives individual results of the few pilot balloon observations that have exceeded 5 km. *Subject Headings:* **1. Stratosphere 2. Upper air wind data 3. Upper air observations 4. Peru.**—*G.J.E.*

4E–149 551.513.1:551.557

Rossby, C.-G., **On the distribution of angular velocity in gaseous envelopes under the influence of large scale horizontal mixing processes.** *American Meteorological Society, Bulletin*, 28(2):53–68, Feb. **1947.** 6 figs., 11 refs., appends. **DWB**—On basis of an intense, thermally driven, lateral mixing process associated with a tendency towards equalization of the vertical component of absolute vorticity, author concludes that during winter, zonal kinetic energy must accumulate at tropopause level, south of latitude 50°N. Strong west wind maximum must be created between 30°N and 50°N, which would increase as it became displaced southwards. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds.**—*G.J.E.*

4E–150 551.557.2

U. S. Air Weather Service. Evaluation and Development Div., **Isograms of wind speed (normal surface) 10,000 ft, 20,000 ft, 10, 13, 16, 19 km, and 700 mb and 500 mb contour charts. January through December, N. Hemisphere.** Washington [**1947**]. 120 charts. **DWB**—Isograms and stream lines drawn for each level and month over Northern Hemisphere. Wind speeds shown in mi/hr. Monthly 500 mb contour charts are drawn. *Subject Headings:* **1. Upper air winds 2. Northern Hemisphere.**—*G.J.E.*

4E–151 551.58:629.13 551.557(729)

*U. S. Weather Bureau, **Weather summary, West Indies, for use with Naval Air Pilot.** *U. S. Hydrographic Office*, H.O. 365, 366 and 530, **1947.** 199+p. tables, charts.—Upper wind data for 11 stations. Wind roses given for each season for levels up to 26,200 ft for Miami; to 32,800 ft for St. Georges (Bermuda), Key West and San Juan (Puerto Rico); to 45,900 ft for Kingston and Swan Island, and to 20,000 ft for Port of Spain. Resultant winds and percentage frequencies of winds from each direction and for different speed groups tabulated. Short notes on the average velocities, prevailing winds and transition levels. *Subject Headings:* **1. Aeronautical climatology 2. Upper air wind frequencies 3. Carabbean area.**—*G.J.E.*

4E–152 551.557(729)

*Wickham, J. C. W., **High pilot balloon results at Piarco, Trinidad.** *Meteorological Magazine*, London, 76(905):251–253, Nov. **1947.** table. **DWB**—Brief analysis of ascents above 40,000 ft, Sept. 1946–Feb. 1947. Results show 70% of winds above 40,000 ft to have a westerly component and about 20% to lie between N and E. *Subject Headings:* **1. Upper air wind frequencies 2. Piarco, Trinidad.**—*G.J.E.*

1948

4E–153 551.557(43)

*Berg, Hellmut, **Ergebnisse von Höhenwindmessungen mit Hilfe elektrischer Peilungen. (Köln, Juni 1942 bis Mai 1943.)** [Results of wind aloft measurements by means of radio location equipment. (Cologne, June 1942 to May 1943).] *Meteorologische Rundschau*, 1(15/16):479–483, Sept./Oct. **1948.** fig., 10 tables, 7 refs. **DWB**—Results of 350 wind-aloft soundings, made by following radiosonde balloons with radio location equipment, analyzed, and presented in graphical (wind-rose) and tabular form. Average monthly values of wind direction and speed (frequencies and vectors) given. Data broken down according to clear, cloudy and rainy days, and interdiurnal change in scalar and vectorial wind is computed for all seasons up to 10 km. Data obtained by this method give a much more representative picture at high levels than do data from theodolite observations as the latter fail when there are clouds or high winds aloft. (*Same item as* 2–131, Feb. 1950, *MAB.*) *Subject Headings:* **1. Upper air wind measurement 2. Germany.**—*M.R.*

4E–154 551.557.2(7):656.7

Canada. Meteorological Div., **Winds at 10,000 m.** *Canada. Meteorological Div., Circular* 1445, Tec-39, May **1948.** 2 p. table. **DWB**—Monthly values derived from U. S. Mean Upper Level Charts for winds at the 10,000 m level on various Canadian air routes. *Subject Headings:* **1. Upper air winds 2. Aeronautical meteorology 3. Canada.**—*G.J.E.*

4E–155 551.557(436)

*Dietzius, Robert, **Die Geschwindigkeiten des Windes in grossen Höhen über Wien.** [Wind velocities at high levels over Vienna.] *Beiträge zur Physik der freien Atmosphäre*, 7(3):174–184, **1948.** fig., 2 tables, refs. **DLC**—Pilot and registering balloon flights to about 16 km above Vienna show a mean wind velocity maximum in the layer between the troposphere and stratosphere. Wind velocities with height by direction are tabulated and diagrammed. *Subject Headings:* **1. Upper air winds 2. Vienna, Austria.**—*M.P.K.*

4E–156 551.557:551.551

Durst, Charles S., **The fine structure of wind in free air.** *Royal Meteorological Society, Quarterly Journal*, 74(321/322):349–360, July/Oct. **1948.** 6 figs., 3 tables. **DWB**—Tabular and graphical results of 21 sets of photographic observations of single and dual smoke puffs ejected at heights of from 5000 to 20,000 ft in clear air (Sept. 1946–Oct. 1947) to determine small variations of wind with height, distance, time and wind speed. Fluctuations at high levels are comparable in periodicity to surface wind fluctuations and those at low levels are correlated with those higher up, but no connection has appeared between wind speed, stability, or type of air and the magnitude of variations. Conditions on cloudy days would probably prove much different from these results obtained during clear weather. (*Same item as* 3K–107, Nov. 1952, *MAB.*) *Subject Headings:* **1. Upper air wind variations 2. Clear air turbulence.**—*C.E.P.B.*

4E–157 551.506.1(596)

*French Indochina. Service Météorologique, **Resumé mensuel du temps en Indochine, 1947–.** Saigon, [**1948–.**] **DWB**—Upper wind frequencies included for each month for 16 compass points and specified speed limits. Values given for 14 stations for the 500 m, 1500 m, 3 km and 6 km levels. *Subject Headings:* **1. Monthly weather reports 2. Upper air wind frequencies 3. French Indochina.** —*G.J.E.*

4E–158 551.509.3:551.557.3

Hoshino, T. and Shono, S., **Forecasting of the wind at higher level.** *Geophysical Magazine*, Tokyo, 20(1),12–20, Nov. **1948.** 5 tables, 14 figs. **DWB**—Using law of conservation of angular momentum, westerly wind is calculated when air is displaced from lower to higher latitudes. Winter pressure patterns over Japan classified and used as basis for forecasting winds at 7 and 10 km. *Subject Headings:* **1. Upper air wind forecasting 2. Japan.**—*G.J.E.*

4E–159 551.557(492):551.513

Lettau, Heinz, **Maximalwerte der Windgeschwindigkeit als Funktion der Erdrotation.** [Maximum values of wind velocity as a function of the earth's rotation.] *Meteorologische Rundschau*, 1(15/16):451–453, Sept./Oct. **1948.** 3 tables, 3 refs., 6 eqs. **DWB**—Table gives maximum winds at various heights over Marquin and Hook van Holland—390 km per hour a km. (*Same item as* 2–134, Feb. 1950, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Atmospheric circulation 3. Netherlands.**—*G.J.E.*

4E–160 551.524.7(691) 551.557.36(691)

*Madagascar. Service Météorologique, **Moyennes de vent et température en altitude.** [Means f upper wind and temperature.] Tananarive, **1948.** 60 p. tables. Mimeographed. **DWB**—Temperature frequency tables followed by tables giving monthly percentage frequencies of winds rom each direction with speeds between specified limits at 700 mb, 500 mb and 300 mb levels for Diego-Suarez, Fort-Dauphin, Maintirano, Majunga, Moroni, Tananarive, Tamatave and Tulear. *Subject Headings:* **1. Upper air temperatures 2. Upper air wind frequencies 3. Madagascar.**—*G.J.E.*

4E–161 551.582.3(691)

Ravet, J., **Atlas climatologique de Madagascar.** [Climatological atlas of Madagascar.] *Madagascar. Service Météorologique, Publication,* No. 10, **1948. DLC**—Atlas includes distribution f temperature, humidity, cloudiness, rainfall, surface and upper winds. Last named are presented n form of wind roses at levels up to 6 km for Jan., April, July and Oct. Wind roses given for ten tations. *Subject Headings:* **1. Climatic atlases 2. Upper air wind frequencies 3. Madagascar.**—*G.J.E.*

4E–162 551.524.7(689.1) 551.557(689.1)

Southern Rhodesia. Meteorological Dept., **Upper air data: Salisbury.** Salisbury, **1948.** p., 13 tables. Mimeographed. **DWB**—Upper air temperature and wind observations made by ircraft and pilot balloon ascents respectively, 1940–1946, summarized in monthly tables. Resultant ector winds for 4 km, 6 km, and 7 km entered in tables against the 600, 500 and 450 mb pressure evels. *Subject Headings:* **1. Upper air temperatures 2. Upper air winds 3. Salisbury, Southern Rhodesia.**—*G.J.E.*

4E–163 551.58:629.13 551.557.36(728)

*U. S. Weather Bureau, **Weather summary, Central America, for use with Naval Air Pilot.** *U. S. Hydrographic Office,* H.O. 531, **1948.** 166+p. tables, charts. **DWB**—Section devoted to upper air ata contains short discussion of prevailing and resultant winds followed by charts showing monthly esultant winds at David (Panama) and Albrook Field (Canal Zone). Seasonal wind roses given for evels up to 20,000 or above for Cristobal, David, Managua, San Salvador, Merida and Tapachula. Percentage frequencies of winds from various directions and for different velocity groups tabulated. *Subject Headings:* **1. Aeronautical climatology 2. Upper air wind data 3. Central America.**—*G.J.E.*

1949

4E–164 551.582(43) 551.557.36

*§Arnoux, J., **Éléments de climatologie des Pays Rhénans du Sud. Palatinat Rhenan, Bade, Sud Wurtemburg.** [Climatological elements of the Southern Rhineland. The Palatinate, Baden, outh Wurtemberg.] Paris, Mission Météorologique Française en Allemagne et en Autriche, **[1948–49?]** 185 p. charts, tables, bibliog. **DWB**—Normal meteorological elements discussed n first five chapters. Ensuing five chapters deal with upper air climatology; chapter on upper winds iving frequencies of different wind directions for five stations. Winds above 5 km grouped together. Frequencies of different wind speeds given up to 7 km. (*Same item as* 3.8–168, Aug. 1952, *MAB.*) *Subject Headings:* **1. Climate 2. Upper air wind frequencies 3. Rhine Palatinate, Germany. France. Mission Météorologique Française en Allemagne et en Autriche.**

4E–165 551.506.1(493)

*Belgium. Institut Royal Météorologique, **Observations du réseau synoptique belge.** [Observations of the Belgian synoptic network.] [Brussels], Jan. **1949. DWB**—A monthly collection f surface and upper air observations in coded form. Wind data are given for individual stations. The number of pilot balloon ascents made during the month varies with each station. *Subject Headings:* **1. Upper air wind data 2. Monthly data bulletins 3. Belgium.**—*G.J.E.*

4E–166 551.557(43)

Berg, Hellmut, **Die Höhenwindverhältnisse über Westdeutschland.** [Upper winds over west Germany.] *Wetter und Klima,* 2(3/4):97–103, March/April **1949.** 2 figs., 9 tables, 4 refs. **DWB**—Based on 372 radio ascents, various places July 1942–Dec. 1944. Gives vector and scalar mean winds, constancy, frequencies of directions for months and seasons, and interdiurnal variability (Sept.) by km heights up to 20 km. Scalar velocity shows a maximum at 10 km at all seasons, falls rapidly to 14–16 km, then nearly constant. (*Same item as* 3–92, Mar. 1940, *MAB.*) *Subject Headings:* **1. Upper air wind frequencies 2. Western Germany.**—*C.E.P.B.*

4E–167 551.515.427:551.557

Byers, Horace R. and Hull, Edwin C., **Inflow patterns of thunderstorms as shown by winds aloft.** *American Meteorological Society, Bulletin*, 39(3):90–96, March **1949.** 9 figs., 9 refs. **DWB**—Balloons ascending simultaneously at various points around thunderstorms followed by radar or radio-direction finding (rawins and rawin-sondes) to determine horizontal inflow or outflow. In early stages of development of thunderstorm cell, inflow or horizontal convergence is present at ground, as well as at all heights reached by the cloud. In a mature thunderstorm cell, observations show outflow or horizontal divergence under cloud base and convergence at all heights between about 4000 and 23,000 feet, with divergence again in uppermost levels. Relationships to rainfall and to cloud entrainment of environmental air shown. (*Same item as* H–203, Aug. 1950, *MAB.*) *Subject Headings:* **1. Thunderstorms 2. Upper air winds 3. Entrainment.**—*Authors' abstract.*

4E–168 551.557:551.509.317

Crowson, Delmar L., **On the variability of upper winds at Eniwetok, Marshall Islands.** *American Meteorological Society, Bulletin*, 30(10):347–351, Dec. **1949.** 3 figs., 3 tables, 6 refs. **DWB**—Twenty five upper air wind soundings made with electronic equipment during 33 hours in May 1948 show evidence of a much greater variability in winds at high levels than expected. At 30,000 or 40,000 ft maximum winds vary by 50 to 100% in an hour, even with high initial speeds, presenting a serious problem for forecasters with only occasional data available. Detailed analysis of results shown graphically and in tables. (*Same item as* 3–93, Mar. 1950, *MAB.*) *Subject Headings:* **1. Upper air wind variations 2. Upper air wind forecasting 3. Eniwetok, Marshall Islands.**—*M.R.*

4E–169 551.508.822:551.557

Ewing, R. A., **The determination of upper winds by electronic means.** *Royal Society of New Zealand, Transactions*, 77(5):76–78, Nov. **1949. DLC**—Discusses advantages and disadvantages of British and U. S. radio-direction finding methods and New Zealand microwave radar. The 700 and 900 megacycle pulse repeater is considered most accurate. (*Same item as* 2.6–22, June 1951, *MAB.*) *Subject Headings:* **1. Radiosondes 2. Upper air wind measurement.**—*C.E.P.B.*

4E–170 551.557:551.588.2(649)

Font Tullot, Inocencio, **Regimen de vientos superiores en Tenerife.** [The winds aloft at Tenerife.] *Revista de Geofisica*, Madrid, 8(32):486–506, Oct./Dec. **1949.** 6 figs., 2 tables, refs. **DWB**—Cloud and surface observations made at an observatory 7000 ft above sea level (Las Canadas del Teide), 1909–1915, and pilot balloon observations made at Izaña from 1916–1934 analyzed to give seasonal wind roses up to 10 km. Discussion included concerning the air circulation around and above Tenerife. (*Same item as* 3A–282, Jan. 1952, *MAB.*) (For more recent study *see* 4.6–154, June 1953, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Orographic influences 3. Wind roses 4. Tenerife, Canary Islands.**

4E–171 551.582(262):656.7

Great Britain. Meteorological Office, **Aviation meteorology of the route Marseilles-Castel Benito.** *Great Britain. Meteorological Office, Meteorological Reports*, No. 4, **1949.** 42 p. 9 figs., 5 tables. 8 refs. 5 appends.—Estimates given of vector mean wind speeds and directions in January and July for whole route at 10,000, 20,000, 30,000 and 40,000 ft levels. Appendix IV gives table of seasonal percentage frequencies of upper wind speeds and direction at 500 and 300 mb levels for Marseilles and 700 and 500 mb levels for Malta. (*Same item as* 4–2, April 1950, *MAB.*) *Subject Headings:* **1. Aviation climatology 2. Upper air winds 3. Marseilles, France 4. Malta.**—*G.J.E.*

4E–172 551.506.7(71) 551.557.36(71)

*Henry, T. J. G. and Armstrong, G. R., **Aerological data for northern Canada.** Toronto, Meteorological Division, May **1949.** 271 p. 16 charts, numerous tables. **GB-MO**—Summary of all aerological data for Canada, north of latitude 58°N. Upper wind data tabulated by seasons for 16 stations, showing number of observations recorded according to speed and direction at selected levels to 8 km. For levels with 20 or more observations, percentage frequencies of different speed ranges and of different directions also given. Data briefly discussed and mention made of jet stream which appears characteristic of colder part of year. Normal temperature and contour charts given for 850, 700, 500 and 300 mb for January, April, July and October. *Subject Headings:* **1. Upper air wind frequencies 2. Jet stream 3. Canada.**—*G.J.E.*

4E–173 551.506.7(52)

*Japan. Central Meteorological Observatory, Tokyo, **Aerological data of Japan. Jan. 1947–.** Tokyo, **1949–. DWB**—Details of individual "Pibal," "Rawin" and "Rabal" ascents given each

nonth for over twenty stations. Wind aloft data and radiosonde observations were first published eparately, then combined. (For further information *see* 4.3–46, March 1953, *MAB*). *Subject Headings:* **1. Upper air wind data 2. Tropopause 3. Japan.**—*G.J.E.*

4E–174 551.501.7:551.557

Mondain, J., **À propos d'une étude des vents en altitude.** [A study of upper winds.] *Journal Scientifique de la Météorologie*, Paris, 1(2):48–52, Apr./June **1949.** 3 figs. English abstract p. 48. **DWB**—The author in working on the spectrum of frequencies of wind speed with heights groups the peed intervals at logarithmic intervals; log V_{n+1} log V_n =constant. He then examines results of oundings made at Limoges and Marignane in the South of France. Calculations of component vind speeds between 5 km and 13 km show for both stations, maxima between 7 km and 8 km, and etween 11 km and 12 km. Minima occur between 6 km and 7 km and near tropopause between 0 km and 11 km. *Subject Headings:* **1. Upper air computations 2. Upper air winds 3. France.**—*G.J.E.*

4E–175 551.524.7:629.13 551.557:629.13

U. S. Air Weather Service, **Mean winds and temperatures at 10,000 and 20,000 feet throughout he United States and world.** Washington, **1949.** 25 p. Mimeographed. **DWB**—From "Normal Weather Maps, Northern Hemisphere Upper Level" charts, upper air wind and temperatures are isted for MATS air routes. Speeds given in knots and marked "Head" or "Tail." Mean seasonal values given for the U. S., East Asia, Pacific, Caribbean, South America, Europe, Africa, Arctic and North Atlantic routes. *Subject Headings:* **1. Upper air temperatures 2. Upper air wind data . Aeronautical climatology.**—*G.J.E.*

4E–176 551.58:629.13 551.557.36(72)

*U. S. Weather Bureau, **Weather summary, Mexico, for use with Naval Air Pilot.** *U. S. Hydrographic Office*, H.O. 532, **1949.** 220 p. tables.—Wind roses given for each season for San Diego, Hermosillo, Vera Cruz, El Paso, Del Rio and Brownsville for heights up to, and even above 20,000 ft. Percentage frequencies given of winds from each direction for different velocity groups. Average velocity indicated for each direction. Resultant winds and mean isobars at 10,000 and 20,000 ft iven by seasons. (*Same item as* 2.6–140, June 1951, *MAB*.) *Subject Headings:* **1. Aeronautical limatology 2. Upper air wind frequencies 3. Mexico. I. Mills, Richard H. II. Hull, Blanche B.** —*G.J.E.*

4E–177 551.582(753)

*U. S. Weather Bureau, **The climatic handbook for Washington, D. C.** *U. S. Weather Bureau, Technical Paper* No. 8, **1949.** 235 p. 36 figs., diags., 137 tables. **DWB**—Compilation of data for 5 years presented in tabular and diagrammatic form. Monthly frequency of wind directions iven at 1 km intervals up to 5 km for each surface wind direction. Average monthly wind speeds iven from ascents made at 4 a.m., 10 a.m., 2 p.m. and 10 p.m. and presented separately. Values iven up to 10 km. Seasonal wind roses also given at 1 km. intervals to 5 km. *Subject Headings:* **. Climatic data 2. Upper air wind frequencies 3. Washington, D. C.**—*G.J.E.*

4E–178 551.506.1 551.506.7 551.471

U. S. Weather Bureau, **Daily Series Synoptic Weather Maps. Northern Hemisphere sea evel and 500 millibar charts with synoptic data tabulations. Jan. 1949–.** Issued monthly. **1949. DWB**—[Continuation of U. S. Air Weather Service, "Northern Hemisphere Historical Weather Maps, sea level and 500 millibars, September 1945–."] Each volume consists of Northern Hemisphere maps for one month, with one surface and one 500 mb map for each day. Upper air data iven for 0300 G.M.T. Winds aloft given for levels up to 20,000 ft. Comprehensive radiosonde nd rawinsonde data included for all areas on a world-wide basis in coded form and pilot balloon ata given for Russia. Rawin data given for levels up to 100 mb. *Subject Headings:* **1. Constant ressure charts 2. Synoptic data 3. Upper air wind data.**—*G.J.E.*

4E–179 551.506.7(7)

*U. S. Weather Bureau, **Daily upper air bulletin Vol. 1, 1948—Vol. 2, 1949 (Oct. 31st).** Washington **1948-49. DWB**—This series discontinued on October 31, 1949 included daily observations f wind aloft for North and Central American stations and for weather ships, at levels up to 20,000 t. Observations for 0300 and 1500Z included. Radiosonde and rawinsonde data also included in oded form for levels up to 100 mb. *Subject Headings:* **1. Upper air wind data 2. Weather ships . North America 4. Central America.**—*G.J.E.*

1950

4E–180 551.506.1(65) 551.506.7(65)

Algeria. Service Météorologique, **Resumé mensuel du temps en Algérie du Nord et du Sahara.** [Monthly summary of weather in northern Algeria and the Algerian Sahara.] No. 1, Jan. **1950.** **DWB**—New series divided into three main parts, third dealing with "Climatologie Aérologique" and including upper wind frequencies for specified directions and speeds for levels up to 5 km for 25 to 30 stations. Radiosonde and radiowind observations up to 300 mb for Maison Blanche (Algiers) and Aoulef-el-Arab tabulated. (*Same item as* 3.7–39, July 1952, *MAB.*) *Subject Headings:* **1. Upper air wind frequencies 2. Algeria.**—*G.J.E.*

4E–181 551.557:551.511

Bannon, J. K., **Shear frequencies in the upper troposphere and lower stratosphere over England.** *Meteorological Magazine*, London, 79(936):161–165, June **1950.** 5 tables, ref., eq. **DWB**—Tables 1–4 give frequencies and mean values of vertical shear (change of vector wind in knots/1000 ft) and log Richardson number at Larkhill in four month, at 450, 300 and 200 mb levels, in stratosphere, troposphere and just above or at tropopause. Table 5 gives frequencies and mean horizontal shear per hour at right angles to vector wind, corrected for curvature, at the same levels. (*Same item as* 9–105, Sept. 1950, *MAB.*) *Subject Headings:* **1. Wind shear 2. Upper air winds 3. England.**—*M.R.*

4E–182 551.551:551.557

Bindon, H. H., **A preliminary report on high level turbulence above 20,000 feet over Eastern Canada.** *National Research Council of Canada, Report*, No. C.C. 125, Sept. **1950.** 6 p. fold. fig. **DWB**—Brief remarks on past research and on the program now in progress in Canada aimed at clarifying such issues as the relationship between high level turbulence and 1) wind shear, 2) Richardson number, 3) wind speed, 4) tropopause and 5) clouds. Feb.–July jet pilot reports of light, moderate or severe turbulence between 20,000 and 40,000 ft over eastern Canada presented graphically by months. *Subject Headings:* **1. Clear air turbulence 2. Upper air winds 3. Aeronautical meteorology 4. Eastern Canada.**—*M.P.K.*

4E–183 551.557:629.13

*Bindon, H. H. and Thorne, W. A., **Winds on the North Atlantic air routes.** *National Research Council of Canada, Report*, No. C.C. 126, Sept. **1950.** 16 p. 6 figs., tables. **DWB**—Mean "on track" (500 mb) wind components along selected North Atlantic air routes analyzed over a four year period. Mean monthly component computed by months for the four years and the parameters necessary to make flight time analyses for schedule planning and aircraft design purposes determined. *Subject Headings:* **1. Upper air winds 2. Aeronautical meteorology 3. North Atlantic Ocean.**—*From author's abstract.*

4E–184 551.513:551.557

Bossolasco, Mario, **Letter on "On the role of the tropics in the general circulation of the atmosphere."** *Tellus*, Stockholm, 2(2):134–136, May **1950.** 2 figs. **DWB**—Supplementary to RIEHL's paper of the above title (*see item* 6–42, June 1950, *MAB*). Author produces previously unpublished results of observations of surface and upper winds at Mogadiscio in the International Polar Year 1932–1933. Mean picture of tropospheric wind field deduced from 1300 pilot balloon ascents. The period Oct. 24–Dec. 5 during which high level ascents were made shows the easterlies intermittently replaced by west winds. Time scale agrees with RIEHL's. No easterlies are found in Sept. at least below the tropopause. (*Same item as* 11–65, Nov. 1950, *MAB.*) *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds 3. Mogadiscio, Italian Somaliland.**—*G.J.E.*

4E–185 551.506.2(677)

*Bossolasco, Mario (ed.), **Osservazioni meteorologiche ed aerologiche eseguite nella Stazione Geofisico di Mogadiscio.** [Meteorological and aerological observations kept at the Mogadiscio Geophysical Station.] Milan, Istituto Geofisico Italiano, [pref. **1950**]. 2 vols. v. 1, entirely tables. 24 refs. Preface in Italian and English. **DWB**—Author describes the part played by Italy in the second International Polar Year (Aug. 1932–July 1933), namely, the establishment of a temporary Geophysical Station in Mogadiscio where 4 times daily surface observations (Pt. 1) and pilot balloon runs (Pt. 2) were kept. (For fuller abstract *see item* 3.5–51, May 1952, *MAB.*) *Subject Headings:* **1. International Polar Year, 1932–1933 2. Upper air wind data 3. Mogadiscio, Italian Somaliland. I. Mogadiscio, Italian Somaliland. Stazione Geofisico II. Istituto Geofisico Italiano, Milan III. Secondo Anno Polar Internazionale, 1932–1933, Participazione Italiana.**—*M.R.*

4E–186 551.557.36 551.587 551.501.7

†Brooks, C. E. P., Durst, Charles S. et al., **Upper winds over the world.** *Great Britain. Meteorological Office, Geophysical Memoirs*, No. 85, **1950.** 149 p. 33 tables, 19 figs., 60 charts, 74 refs., 4 appends. **DWB**—Memoir aims at constructing roses of wind speed and direction at any height up to 40,000 ft at any place where the vector mean wind and standard vector deviation are known. Second part of publication gives world charts of the 700, 500, 300, 200 and 130 mb surfaces for all seasons and explains method of construction. Pt. III contains charts of mean standard vector deviation for same levels and seasons. These were made possible by discovery that almost to level of tropopause the product of standard vector deviation with air density is in most cases a constant for any one place and season. Method of extrapolation described. Pt. IV gives seasonal charts of stream lines and mean vector speed up to 200 mb in tropics. (*Same item as* 10–117, Oct. 1950, *MAB.*) *Subject Headings:* **1. Statistical techniques 2. Upper air wind roses 3. Upper air wind frequencies. I. Carruthers, Nellie II. Dewar, D. III. Sawyer, J.**—*G.J.E.*

4E–187 551.582(596/9) 551.557(596/9)

Bruzon, E., Carton, P. and Romer, A., **Le climat de l'Indochine. Aperçu général et régime des vents.** [The climate of Indochina. General survey and wind flow.] Saigon, Haut Commissariat de France en Indochine, Service Météorologique, **1950.** 159 p. tables, charts. **GB-MO**—Work divided into two parts, second dealing with surface and upper winds. Winds discussed by seasons and the main upper air currents are treated in some detail. Tables give percentage frequencies of wind from each direction for 9 stations, of wind speeds between 50 and 75 km/hr, and of wind speeds greater than 75 km/hr, for levels up to 6 km, during Jan., April, July and Oct. *Subject Headings:* **1. Climate of French Indochina 2. Upper air winds 3. French Indochina.**—*G.J.E.*

4E–188 551.508.11:551.511:551.557

Durst, Charles S., and Gilbert, G. H., **Constant height balloons—calculation of geostrophic departures.** *Royal Meteorological Society, Quarterly Journal*, 76(327):75–86, Jan. **1950.** fig., 6 tables, 7 refs., 5 eqs., 2 appends. Discussion p. 87–88. **DWB**—Accelerations observed during flight of seven constant height balloons at 400–500 mb level at one half hourly intervals over 2 to 4½ hour flights gave values of departures from geostrophic motion close to those deduced independently from 500 mb contour charts and observed winds. Variations greater than would be expected from errors in wind determination, owing to eddies in wind at level of flight. (*Same item as* 3–17, March 1950, *MAB.*) *Subject Headings:* **1. Constant level balloons 2. Upper air wind variations.**

4E–189 551.506.5(988)

France. Météorologie Nationale, **Expéditions polaires françaises. Recueil des observations météorologiques effectuées par la Station française du Groënland entre le 20 Juillet 1949 et le 14 Juillet 1950.** [French polar expeditions. Meteorological observations made by the French station in Greenland between July 20, 1949–July 14, 1950.] Paris, Sept. **1950.** 162 p. Mimeographed. **DWB**—Observations presented in coded form. Daily surface and upper air observations included. Pilot balloon ascents and wind soundings made with ratiosonde ascents are given. *Subject Headings:* **1. Arctic expeditions 2. Upper air wind observations 3. Greenland.**—*G.J.E.*

4E–190 551.524.7 551.557(44)

France. Météorologie Nationale, **Répartition des températures et des vents près du sol, à 3000 et à 6000 mètres, pendant les mois de janvier et de juillet à Paris (Trappes ou St.-Cyr), à Lyon (Bron) et à Salon (Bouches-du-Rhône).** [Distribution of temperatures and winds at the surface, at 3 km and 6 km during the months of January and July at Paris (Trappes or St. Cyr), at Lyon and at Salon.] Paris, [**1950?**] 21 p. tables.—Tables given of upper air temperatures and winds. Wind data presented in form of frequencies from each direction for different speed groups. Data covers 1946–49 at Trappes, 1947 and 1949 at Salon, and 1921–1944 at Lyon. Lyon observations obtained by pilot balloon ascents. *Subject Headings:* **1. Upper air temperatures 2. Upper air wind data 3. France.**—*G.J.E.*

4E–191 551.582(61,62):656.7

Great Britain. Meteorological Office, **Aviation meteorology of the route Castel Benito-Cairo.** *Great Britain. Meteorological Office, Meteorological Report*, No. 5, **1950.** 46 p. 9 figs., 2 tables, 12 refs., 5 appends. **GB-MO**—Appendix IV includes tables of seasonal percentage frequencies of upper wind speed and direction at 500 and 700 mb levels for Malta and Cairo. Diagrams given in text of percentage frequency of equivalent tailwinds and headwinds greater than any given value. *Subject Headings:* **1. Aviation climatology 2. Upper air wind frequencies 3. Malta 4. Cairo, Egypt.**—*G.J.E.*

4E–192 551.557:629.13

Great Britain. Meteorological Office, **Equivalent headwinds on some of the principal air routes of the world.** *Great Britain. Meteorological Office, Meteorological Reports*, No. 7, **1950.** 19 p. 2 figs., 12 p. tables. M.O. 535b. **DWB**—An equivalent head (or tail) wind is the uniform wind along an air route which results in the same average ground speed as that actually attained. Tables give for each season estimated headwinds at 10,000, 20,000, 30,000 and 40,000 ft, both outward and return, for 120 air routes in all parts of the world. Standard deviations are given and a table for calculating headwind likely to be exceeded on any proportion of the flights. (*Same item as* 2.1–123, Jan. 1951, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Aviation climatology.**—*M.R.*

4E–193 551.551

Hislop, G. S., **Gusts—from a clear sky.** *Aircraft*, Melbourne, 29(3):18–19, 40–41, Dec. **1950.** 5 figs., table, eq. **DLC**—As a result of more than 90,000 miles of flight with two Mosquito Aircraft over Europe at levels between 15,000 and 37,000 ft, it is concluded that a marked wind gradient in the vertical associated with strong horizontal temperature gradient was the most likely cause of turbulence. Half of the cases of high level turbulence were within 2000 ft of the tropopause. (*Same item as* 3K–152, Nov. 1952, *MAB.*) *Subject Headings:* **1. Clear air turbulence 2. Gustiness 3. Tropopause.**—*M.R.*

4E–194 551.513:551.557.2(4)

Hovmöller, Ernest, **Zonal and meridional air currents in the stratosphere over Europe.** *Geofisica Pura e Applicata*, 17(3/4):112–120, Oct./Dec. **1950.** 2 figs., 5 tables, 8 refs. In English. **MH-BH**—A statistical study of daily, monthly and seasonal upper air winds at the 300 and 100 mb levels over Lerwick and Larkhill in the British Isles, based on data for 1945–49, shows some remarkable features of zonal and meridional circulation not evident from tables of monthly mean values. Variations in wind from day to day shown to be very rapid and sometimes extreme, especially in region of tropopause (or jet stream). (*Same item as* 2.5–66, May 1951, *MAB.*) *Subject Headings:* **1. Upper air wind variations 2. Atmospheric circulation 3. British Isles.**—*M.R.*

4E–195 551.506.7(51)

*Japan. Central Meteorological Observatory, Tokyo, **Aerological data of Dairen. (Winds aloft). March–Dec. 1944, Jan.–March 1945.** Tokyo, **1950.** 32 p. **DWB**—Details given of individual pilot balloon and radar-wind ascents. *Subject Headings:* **1. Upper air wind data 2. Dairen, China.**—*G.J.E.*

4E–196 551.557.36(96)

Moir, R. W., **A brief note on the upper winds at 30,000 ft. over Nandi, Fiji.** *New Zealand. Meteorological Office, Circular Note*, No. 59, **1950.** 2 p. 5 tables. **DWB**—Summary of winds at 30,000 ft based on pilot balloon observations between May 1941 and December 1949 combined with radiosonde ascents made during 1945 and from May 1948 onwards. Frequency tables for each season and monthly maximum wind velocities given. *Subject Headings:* **1. Upper air wind frequencies 2. Nandi, Fiji.**—*G.J.E.*

4E–197 551.507.321:551.501.7

Murray, W. D., Schneider, C. S. and Smith, J. R., **Development and utilization of constant-level balloons.** *American Geophysical Union, Transactions*, 31(6):843–848, Dec. **1950.** 5 figs., table, 4 refs. **DWB**—The properties of constant level plastic nonextensible balloons and their use in determining air trajectories and as a vehicle for carrying instruments to a desired level, discussed. (For fuller abstract *see item* 2.5–28, May 1951, *MAB.*) *Subject Headings:* **1. Constant level balloons 2. Observation techniques.**

4E–198 551.557:551.547

Reinecke, Ingrid, **Abweichungen vom Gradientwind in der oberen Troposphäre.** [Departures from the gradient wind in the upper troposphere.] *Berlin. Freie Universität. Institut für Meteorologie und Geophysik, Meteorologische Abhandlungen*, 1(1), **1950.** Summary in: *Annalen der Meteorologie*, 4(1–6):226, **1951. MH-BH**—Inflow to low pressure at ground must be compensated by outflow at higher levels; this is found statistically to be about 4°, varying with pressure type. (*Same item as* 3.7–145, July 1952, *MAB.*) *Subject Heading:* **1. Ageostrophic winds.**—*C.E.P.B.*

4E–199 551.513:551.557

Riehl, Herbert, **On the role of the tropics in the general circulation of the atmosphere.** *Tellus*, Stockholm, 2(1):1–17, Feb. **1950.** 16 figs., 23 refs. **DWB**—In general discussion of role of tropics,

uthor brings out highly variable nature of air currents in middle and upper troposphere over low atitudes. Upper wind summaries show in some locations lower easterlies giving way to upper vesterlies during all seasons. In other regions easterlies gain their maximum values in the upper roposphere at least during part of the year. (*Same item as* 6–42, June 1950, *MAB.*) (*See also* –39, Aug. 1950, *MAB.*) *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds . Tropics.**—*M.P.K.*

4E–200 551.557.36 551.558

*South Africa. Weather Bureau, **Bowinde in Suidelike Afrika.** [Upper winds in Southern Africa.] Pretoria, [1950?] 281 p. mostly tables. In English and Afrikaans. *South Africa. Weather Bureau, W.B.* 13. Price 8/6. **DWB**—A voluminous presentation of pilot balloon data up o 7 km for numerous stations in South Africa, in the form of frequencies, wind roses, resultants of vind and mass transport, and calculated vertical velocity (cm/sec) for various levels over South Africa. A discussion of orographic effects on the circulation, diurnal variations, statistical methods f analysis and synthesis, and a list of the coordinates for the 36 stations used in this report are ncluded. Records date from 1926 to 1948. *Subject Headings:* **1. Upper air wind data 2. Vertical elocities 3. Orographic effects 4. South Africa 5. Rhodesia.**—*M.R.*

4E–201 551.506.7(7)

U. S. Navy. Fleet Weather Central, **Daily upper air bulletin, 1950–.** Washington, D. C., **950–. DWB**—The bulletin gives unedited data as received from teletype of radiosonde and wind loft observations made at North and Central American stations. Observations are given in coded orm for 0300Z and 1500Z. *Subject Headings:* **1. Upper air wind data 2. North America 3. Central America.**—*G.J.E.*

4E–202 551.506.7(988) 551.557.36(988)

*U. S. Weather Bureau, **Climatological summary. Thule, Greenland.** Washington, D. C., **950.** 38 p. 34 tables. **DWB**—Surface and upper air data presented for Oct. 1946 to Dec. 1949. Upper wind data summarized to show frequency of directions by speed groups for each month at , 3, 6, 9 and 12 km. *Subject Headings:* **1. Upper air wind frequencies 2. Climatic data 3. Thule, Greenland.**—*G.J.E.*

4E–203 551.506.7:551.513:551.557(98)

Vederman, J. and Smith, C. D., **The winter mid-troposphere circulation near the North Pole.** *American Meteorological Society, Bulletin,* 31(6):197–205, June **1950.** 7 figs., 13 refs. **DWB**—Observations at 500 mb made by Ptarmigan reconnaissance flights to North Pole used to compute nean temperature, height and wind fields for first quarter of 1949. Winds indicated by arrows on igures showing contours and isotherms over area 70°N to the pole and 160°E–80°W. (*Same item as* –40, Aug. 1950, *MAB.*) *Subject Headings:* **1. Airplane weather reconnaissance 2. Atmospheric irculation 3. Upper air wind observations 4. Arctic 5. North Pole.**—*G.J.E.*

1951

4E–204 551.506.1(931)

*Apia. Observatory, **Magnetic and meteorological results for 1949.** Wellington, N. Z., Govt. Printer, **1951.** 146 p. mostly tables. **DWB**—The meteorological data collected under the supervision of the New Zealand Meteorological Dept., consist of the usual daily synoptic observational data plus sunshine, wind frequency, upper winds (daily), vapor pressure. (For fuller abstract see item 4.3–37, March 1953, *MAB.*) *Subject Headings:* **1. Climatic data 2. Observational data . Annual summaries 4. Magnetic observations 5. Upper air wind data 6. Apia, Samoa.**

4E–205 551.557.31:551.547.31

Arakawa, Hidetoshi, **Diurnal variation of wind velocity and pressure in the upper atmosphere.** *Papers in Meteorology and Geophysics,* Tokyo, 2(2):129–131, June **1951.** fig., 2 refs. **MH-BH**—On basis of harmonic analysis of a ten-year record of hourly wind velocity data obtained at Mt. Fuji Observatory and of a harmonic analysis of pressure records for the same period at the Central Meteorological Observatory, Tokyo, author shows phase of semidiurnal tide at Mt. Fuji to be about alf an hour behind that observed at Tokyo. A high negative correlation was reported between aily march of pressure and that of wind speed. An analysis of the relationship between hourly epartures from mean pressure and hourly departures from mean wind velocity, expressed in a egression equation "suggests that some percentage of the released potential energy due to the owering of the isobaric surface will contribute to the increase of wind speed in the upper atmosphere." *Same item as* 4.3–188, March 1953, *MAB.*) *Subject Headings:* **1. Upper atmosphere 2. Diurnal vind variations 3. Diurnal pressure variations 4. Harmonic analysis 5. Mt. Fuji Observatory, apan.**—*I.L.D.*

4E–206 551.589 551.582(94):656.7

Australia. Meteorological Branch, **Meteorological conditions affecting aviation on international air routes to Australia and Australian internal air routes (I) Sydney-Darwin (II) Darwin-Singapore.** Melbourne, **1951.** Various paging. **DWB**—Other sections of this publication to be issued later. Seasonal wind roses given for varying levels from surface to 16,000 ft for stations along routes. General information given on upper winds to 46,000 ft for the different seasons over sections of each route. *Subject Headings:* **1. Upper air winds 2. Aeronautical meteorology 3. Australia.**—*G.J.E.*

4E–207 551.551:551.557

Bannon, J. K., **Turbulence at high altitude; a further meteorological analysis.** *Meteorological Magazine*, London, 80(953):331–332, Nov. **1951.** table, 7 refs. **MH-BH**—Summarizes an analysis (*Met. Research Paper*, No. 660, London 1951) of turbulence between 18,000 and 40,000 ft in 1950 compared with upper air data. In most cases turbulence was associated with wind shear. Turbulence without shear may be due to degradation of large eddies. (*Same item as* 3.3–153, March 1952, *MAB.*) *Subject Headings:* **1. High level turbulence 2. Upper air winds.**—*C.E.P.B.*

4E–208 551.506.1 551.557.36(675)

Belgian Congo. Service Météorologique, **Bulletin.** First issue received, No. 1, Jan. **1951.** Last issue received, No. 8, Aug. **1951.** Monthly. **DWB**—Contains section on "Aerologie" with monthly wind roses at 600 m intervals for 8 or 9 stations in the area. Several months give observations for heights above 5 km. (For fuller abstract *see* 3.10–22, Oct. 1952, *MAB.*) *Subject Headings:* **1. Upper air wind roses 2. Monthly climatic reports 3. Belgian Congo 4. Ruandi-Urundi.**—*G.J.E.*

4E–209 551.557:656.7

Du Jonchay, I., **L'importance des vents portants en altitude notamment dans l'hemisphère sud.** [The importance of high level winds especially in S. Hemisphere.] (In: Convegno Internazionale di Meteorologia Marittima, Genova, Sept. 20–22, 1951, **Atti, 1951,** p. 52–57.)—Discusses the importance of upper winds in flight planning in the light of present knowledge and makes proposals for improving our knowledge of the upper air flow. The author takes as an example the route from Europe to Australia and argues that this will be made via South Africa and the Kerguelen Islands and not via India. Routes in the S. Hemisphere will be of a one-way nature—the "Southern Circus." *Subject Headings:* **1. Upper air winds 2. Aeronautical meteorology.**—*G.J.E.*

4E–210 551.582(51)

Gherzi, E., **The meteorology of China. Vol. I. Vol. II. General tables and graphs.** tables, figs., maps, refs. Macao, Servico Meteorologico, **1951.**—Chap. V. of Vol. I deals with surface and upper winds. Table 17 of Vol. II gives results of pilot balloon ascents and of soundings made by airline pilots. Monthly mean wind speed and direction given for each month for Zikawei, Hongkong, Nanking, Hankow, Amoy, Peiping and Tsingtao. Heights vary with months and place but several results exceed 5 km. Table 18 of Vol. II includes mean monthly direction from which clouds approach. Figures of more than 14,000 observations of cloud height given to establish probable heights of the three main cloud levels. *Subject Headings:* **1. Climate of China 2. Upper air wind data 3. Cloud height 4. China.**—*G.J.E.*

4E–211 551.506.5:551.506.7(99)

*§Gibbs, W. J., Gotley, A. V. and Martin, A. R., **Heard and Macquarie Islands 1948. Part I (a), Results; Part I (b), Analyzed charts.** *Australian National Antarctic Research Expedition, A.N.A.R.E. Reports, Series D*, V. I, Pts. I (a) and I (b), Oct. **1950,** and Oct. **1951.** 2 v. tables, charts. **DWB**—First part includes results of observations at Heard and Macquarie Islands, during 1948, printed from Hollerith cards. Tables contain data on pressure, temperature, dew point depression, surface wind direction and speed, maximum wind, daily precipitation, sunshine duration, temperature at 850, 700, 500, 300, 200, 100 mb and tropopause; pressure and geopotential of tropopause; actual surface, pilot balloon and radiosonde observations. Observers listed and codes explained in detail. Second volume of Pt. I contains daily analyzed charts of Antarctic for June and Dec. 1948. The Dec. 1948 charts cover a much broader area than the June. (*Same item as* 3.5–52, May 1952, *MAB.*) *Subject Headings:* **1. Observational data 2. Synoptic charts 3. Upper air data 4. Radiosonde data 5. Heard Island 6. Macquarie Island 7. Antarctica. I. Australia. Dept. of External Affairs. Antarctic Division II. Australian National Antarctic Research Expedition, 1947–1949 III. Law, Phillip G.** (*ed.*).—*M.R.*

4E–212 551.506.7(829) 551.557.36(829)

Gray, R. and Carruthers, Nellie, **Upper air over the Falkland Islands.** *Meteorological Magazine*, London, 80(947):125–130, May **1951.** 4 figs., 2 tables, 2 refs. **DWB**—Upper air temperatures and winds at Port Stanley, Feb. 1948–May 1950, summarized. Seasonal wind roses given at standard

evels up to 150 mb with corresponding average speed in knots shown beside each wind rose. (*Same item as* 2.11–181, Nov. 1951, *MAB.*) *Subject Headings:* **1. Upper air temperatures 2. Upper air wind frequencies 3. Port Stanley, Falkland Islands.**—*G.J.E.*

4E–213 551.582(267,69,54)

Great Britain. Meteorological Office, **Weather in the Indian Ocean to latitude 30°S. and ongitude 95°E. including the Red Sea and Persian Gulf. Volume II. Local Information.** London, H.M.S.O., **1940–1951.** Parts 1–9 published separately. Parts paged separately. figs., tables, refs. **DWB**—Primarily for naval use, the work is based largely on coastal and marine data. Upper wind requencies and wind roses given for months and/or seasons for selected stations. Most cases not xtended above 10,000 ft but supplemented with cloud data. Some figures based on only available lata for areas concerned. *Subject Headings:* **1. Climatology 2. Upper air wind frequencies 3. Indian Ocean.**—*G.J.E.*

4E–214 551.551:629.13

Harrison, Henry T., **Some meteorological problems indicated for jet transport operation at 40,000 ft.** *Aeronautical Engineering Review*, N. Y., 10(4):52–61, April **1951.** 13 figs., 6 refs. Abstracted from reprint. **DWB, DLC**—Temperature wind and turbulence are the three most important actors affecting flight at 40,000 ft. Statistics presented to show magnitude of these factors and uccess which present-day forecasting methods achieve for jet transport operation at these levels. (*Same item as* 3K–171, Nov. 1952, *MAB.*) *Subject Headings:* **1. Clear air turbulence 2. Upper air lights 3. Aeronautical meteorology 4. Upper air winds.**—*M.R.*

4E–215 551.513.2:551.557

Hutchings, J. W. and Row, Ann L., **The mean circulation at high levels over New Zealand.** *New Zealand. Meteorological Office, Circular Note*, No. 69, **1951.** 2 p. table. **DWB**—Monthly verages of height of 60 mb surface computed for Auckland and Hokitika. From these the mean onal components of wind between them are derived and show predominantly easterly winds in Dec. nd Jan. and westerly winds prevailing in other months with a winter maximum of 15–20 knots. (*Same item as* 4D–244, April 1953, *MAB.*) *Subject Headings:* **1. Stratospheric winds 2. Atmospheric circulation 3. New Zealand.**—*G.J.E.*

4E–216 551.58:629.13 551.557.36(569.1)

Lebanon. Service Météorologique, **Climatologie aéronautique, 1946–48–.** [Aeronautical climatology.] Beyrouth, Observatoire de Ksara, **1951. DWB**—Monthly frequencies of visibility, loud heights and surface and upper winds given to 5 km and above (prewar data not above 3 km). Frequencies given of winds from different directions within specified speed limits for Beyrouth, Tripoli and Rayak. *Subject Headings:* **1. Aeronautical climatology 2. Upper air wind frequencies 3. Lebanon 4. Tripoli.**—*G.J.E.*

4E–217 551.557.2:551.501.7(469)

Morais, José C. de, **Calões pilotos em Coimbra.** [Pilot balloon observations at Coimbra.] *Coimbra. Universidade. Faculdade de Ciencias, Revista*, 20, **1951.** 19 p. 4 figs., 9 tables, 13 refs. n Portuguese, French summary p. 20. Abstracted from reprint. **DWB**—Seasonal upper wind oses, data and discussion based on 533 pilot balloon observations at Coimbra, 1950 and 1951. Data lso given for 700 and 500 mb levels. Analysis of data shows sea breeze effects in summer, "monsoon" ffects in summer and winter, relation between wind and current temperature, rotation of resultant inds with height and statistical representativeness of sample as a measure of the prevailing condiions. New type of wind rose is presented to show relation between statistically "correct" distribuion of wind direction, speed and frequency, and that observed. (*Same item as* 3.10–201, Oct. 1952, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Wind roses 3. Pilot balloon observations 4. Coimbra, Portugal.**—*M.R.*

4E–218 551.557

Reinhard, H., **Höhenwindverhältnisse im Gebiete des Ärmelkanals.** [Upper wind conditions n the region of the English Channel.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 2(3):110–122, **1951.** 8 figs., 4 tables. German, English and French summaries p. 110. **MH-BH**—Study of winds at 1, 5, 10, 11, 12 km above Boulogne, Cherbourg and Hook of Holland, btained by radio direction finding 1941–43. Tables and diagrams show direction and velocity by nonths and seasons, and discontinuities of direction or speed. Mean winds at 16 km given. (*Same item as* 3.2–127, Feb. 1952, *MAB.*) *Subject Headings:* **1. Upper air wind variations 2. English Channel.**—*C.E.P.B.*

4E–219 551.557

Sarasola, Simón, **Investigaciones sobre las corrientes superiores en Colombia.** [Investigations on upper air currents in Colombia.] *Revista Meteorológica*, Montevideo, 10(36/37):13–15, Jan./April, **1951. MH-BH**—Review attempt to prove prevailing winds in Colombia are the antitrades. Theory weak because investigations show upper air currents unstable. (*Same item as* 3.6–125, June 1952, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Colombia.**—*M.L.R.*

4E–220 551.509.317(02)

U. S. Air Weather Service, **High-level isotach analysis.** *U. S. Air Weather Service, Manual* 105–26, Feb. **1951.** 10+p. 9 figs., refs. **DWB**—Manual gives procedure, theory and examples of charts constructed by technique of isotach analysis. In each instance the 30,000 ft isotach analysis is compared with the 300 mb contour analysis for the same time. (For fuller abstract *see* 3.1–58, Jan. 1952, *MAB.*) *Subject Headings:* **1. Isotach analysis 2. Upper air wind charts 3. Manuals.**—*M.R.*

4E–221 551.506.7(71):551 557.36(71)

*U. S. Weather Bureau, **Climatological summary, Eureka N.W.T., Canada.** Washington, D. C., **1951.** 72 p. 34 tables. **DWB**—Surface and upper air data presented. Upper wind measurements, July 1947–Dec. 1950, summarized to show frequency of wind directions by speed groups for each month at 1, 3, 6, 9 and 12 km. *Subject Headings:* **1. Upper air wind frequencies 2. Climatic data 3. Eureka, Canada.**—*G.J.E.*

4E–222 551.506.7(71) 551.557.36(71)

U. S. Weather Bureau, **Climatological summary, Resolute N.W.T., Canada.** Washington, D. C., **1951.** 62 p. 34 tables. **DWB**—Surface and upper air data presented for Oct./Nov. 1947–Dec. 1950. Upper wind data summarized to show frequency of directions by speed groups for each month at 1, 3, 6, 9 and 12 km. *Subject Headings:* **1. Upper air wind frequencies 2. Climatic data 3. Resolute, Canada.**—*G.J.E.*

4E–223 551.557:551.508.57

Venkiteshwaran, S. P. and Yegnanarayanan, S., **Radar measurements of upper winds over Poona during the southwest monsoon.** *Indian Journal of Meteorology and Geophysics*, 2(3):228–232, July **1951.** 2 figs., tables. **MH-BH**—Upper winds up to 10 km and more during two monsoon periods summarized. Mean wind speed and direction at different heights shown graphically for monsoon months, and isopleths of east-west components given. When the monsoon is active near Poona, it is approximately 6 km deep and blows from the west. Aloft, wind changes sharply to east. In winter months strong west winds above 5 km and east winds below this level observed. (*Same item as* 3.7–146, July 1952, *MAB.*) *Subject Headings:* **1. Radar measurement 2. Upper air winds 3. Monsoons 4. Poona, India.**—*A.A.*

4E–224 551.513.2:551.557.3

Vul'fson, N. I., **Raschet nezonal'nogo sluchaia statsionarnoĭ tsirkuliatsii atmosfery.** [Calculation of a nonzonal stationary atmospheric circulation.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geofiz.*, No. 2:56–74, **1951.** 12 figs., 18 refs., 12 eqs. **DLC**—Horizontal sections of atmospheric flow at 1000, 5000 and 10,000 m for July and Jan. and also vertical sections along 30° west longitude; 0°, 30° and 60° east longitude, along 20° latitude for July and along 40° and 20° latitude for Jan. given. Mean intensity of vertical flow in July from ground level to mean height of cirrus clouds compared with various moisture zones over Europe, northern Africa and central and southwestern Asia. (For fuller abstract *see* 3.4–125, April 1952, *MAB.*) *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds 3. Southern Europe 4. Northern Africa 5. Southwestern Asia.**—*I.L.D.*

4E–225 551.513:551.557

Wexler, Harry, **Spread of the Krakatoa volcanic dust clouds as related to the high-level circulation.** *American Meteorological Society, Bulletin*, 32(2):48–51, Feb. **1951.** 2 figs., 7 refs. **MH-BH**—Analysis of general circulation factors responsible for slow spread of volcanic ash cloud of Krakatoa explosion toward poles, compared with its rapid spread around the earth. It took from Aug. to Nov. (3 months) for the large scale eddy diffusivity (operating at lower and lower latitudes as winter advances) to catch the dust cloud in the N. Hemisphere westerlies and bring it over the United States and Europe. Scheme based on 19 km mean monthly circulation charts. (*Same item as* 2.9–84, Sept. 1951, *MAB.*) *Subject Headings:* **1. Meridional circulation 2. Upper air winds 3. Volcanic dust 4. Krakatoa winds.**—*M.R.*

1952

4E–226 551.582(265/6):656.7

Australia. Meteorological Branch, **A report on meteorological conditions affecting aviation over he Sydney to Vancouver air route.** Melbourne [1952.] 99 p. 50 figs., numerous tables, 6 appends. **DWB**—Flying conditions along route and at principal airports described. Principal ontrolling factors of the weather discussed together with typical synoptic situations. Appendix 1 evoted to upper winds. Wind roses given for 9 stations at six levels up to 10 km., for Dec.–Feb., Iarch–May, June–Aug. and Sept.–Nov. Approximate estimates are given of mean effective headinds at 10,000 and 25,000 ft and the frequency distribution of effective headwinds at 25,000 ft is iven for aircraft speeds of 400 m.p.h., for winter and summer. The trans-Pacific route is split into sections for this purpose. (*Same item as* 4D–230, April 1953, *MAB.*) *Subject Headings:* **1. Aeroautical meteorology 2. Upper air wind frequencies 3. Upper air wind roses 4. Pacific.**—*H.P.K.*

4E–227 551.551:551.524.7

Berggren, Roy, **The distribution of temperature and wind connected with active tropical air in he higher troposphere and some remarks concerning clear air turbulence at high altitude.** *Tellus,* (1):43–53, Feb. **1952.** 6 figs., refs., 2 eqs. **MH-BH**—Taking advantage of the extensive European adiosonde network in existence today, author tackles problem of extending investigation of fronts nto lower stratosphere. Sea-level charts, 500 mb charts and synoptic aerological cross sections showing frontal boundaries, tropopause, inversions, isotherms and isovels (observed wind speed)] erve to illustrate test cases from Oct. and Nov. 1949. Review of recent British investigations of lear air turbulence and analysis of an additional example of clear air turbulence comprise the second art of the paper. Detailed study of synoptic aerological charts to determine wind shear at various eights might be key to prognostic problems of clear air turbulence. (*Same item as* 3K–189, Nov., 952, *MAB.*) *Subject Headings:* **1. High level turbulence 2. Upper air winds 3. Synoptic aerology . Tropopause.**—*M.P.K.*

4E–228 551.506.1:551.506.7(491)

Denmark. Meteorologisk Institut, **Aerologiske observationer i Danmark. Thorshavn.** Aerological observations in Denmark. Thorshavn (Faroe Islands).] July 1, **1952–.** Also: . . . **Kastrup.** July 1, **1952–.** Mimeographed. **GB-MO**—Results of daily upper air soundings for Thorshavn and Kastrup given in "Temp." and "Pilot" code form. *Subject Headings:* **1. Upper ir data 2. Denmark.**—*G.J.E.*

4E–229 551.509.317:551.524.7:551.557

Durst, Charles S., **High level winds and temperatures for jet aircraft operation.** *Royal Meorological Society, Quarterly Journal,* 78(337):442–448, July **1952.** 4 figs., table, 4 refs. **DWB**—Describes work done to meet demand for wind information for planners. Evolution of vector orrelation coefficients is referred to and the results of these calculations for winds at varying times and istances show that the time correlation coefficients showed no great variation with height or season, nd the spacial correlation coefficients were lower in lower latitudes. Example given of application f these general results. Forecasting problems briefly discussed and data from flights of a "Comet" ircraft over the route Cairo-Khartoum, Dec.–Feb., March–May and June–Aug. tabulated. *Subject Headings:* **1. Upper air winds 2. Upper air temperatures 3. Aeronautical meteorology.**—*G.J.E.*

4E–230 551.557.3(42,262)

Durst, Charles S., **The relation between wind flow over the British Isles and the Mediterranean.** *Great Britain. Meteorological Research Committee, M.R.P.* 776, Nov. 24, **1952.** 2 p. 2 tables. Mimeographed. **GB-MO**—Winds at 200 mb over Larkhill correlated with those over Rome and Malta. Vector coefficients (−0.15 to −0.30) were significant at all seasons, possibly indicating a artial compensation in zonal flow. *Subject Headings:* **1. Upper air wind variations 2. British Isles . Mediterranean.**—*C.E.P.B.*

4E–231 551.557.3

Durst, Charles S., **The variation of wind in short periods of time between 30,000 and 35,000 eet, January, 1950 to January, 1952.** *Great Britain. Meteorological Research Committee, M.R.P.* 745, Sept. 9, **1952.** 4 p. 4 tables. Mimeographed. **DWB**—Observations of 86 pairs of smoke uffs emitted by aircraft at Orfordness, England, at intervals of 10 min are used to calculate vector hange of wind (knot/10 min). Values ranged from 0.7 to 21.0; the larger ones tended to occur with reatest wind speeds and near tropopause or in stratosphere. *Subject Heading:* **1. Upper air wind ariations.**—*C.E.P.B.*

4E–232 551.506.1(829,99) 551.557.36

Falkland Islands and Dependencies. Meteorological Service, **Annual meteorological tables 951.** Prepared in conjunction with the Meteorological Office. London, Stanley, [1952]. 38 p.

Mostly tables. Inserted: Amendments dated Nov. 1, 1952. **GB-MO**—Annual upper air wind data for Stanley, observed by Air Ministry Radio Sonde Unit, presented in form of frequencies of wind-speeds between certain limits, and frequencies of winds from specified directions. Frequencies are given up to 100 mb (53,044 ft). *Subject Headings:* **1. Annual meteorological reports 2. Upper air wind frequencies. I. Great Britain. Meteorological Office.**—*G.J.E.*

4E–233 551.506.7(471.1)

*Finland. Ilmatieteellinen Keskuslaitos, **Aerologiset Havainnot Suomessa.** [Aerological observations for Jan. 1952 made in Finland.] First issue Jan. 1952. Helsinki, March 10, **1952.** entirely data. In Finnish and Swedish. **DWB**—Results of twice-daily radiosonde observations made at two stations in Finland (Ilmala 60°N and Sodankyla 67°N) in Jan. 1952 according to temperature and Pilot Code. Wind aloft observations were made by following radiosonde balloon with theodolite. No summary is provided, but observations are checked before being published after end of each month. (*Same item as* 3.11–47, Nov. 1952, *MAB.*) *Subject Headings:* **1. Radiosonde data 2. Upper air wind data 3. Monthly bulletins 4. Finland.**—*M.R.*

4E–234 551.557:629.13

Gabites, J. F. and Porter, E. M., **Equivalent head winds at 30,000 feet on South Pacific air routes during 1951.** *New Zealand. Meteorological Office, Technical Note,* No. 83, **1952.** 4 p. 3 tables. Also: **Equivalent head winds on air routes leading to New Zealand.** *Ibid.,* No. 86, **1952.** 4 p. 2 tables, 3 figs., 8 refs. Mimeographed. **DWB**—1) Daily charts of 300 mb surface used to obtain monthly and seasonal mean equivalent headwinds on air routes Nandi-Auckland, Sydney-Auckland and Melbourne-Christchurch. Satisfactory agreement shown between these values and estimates given in "Equivalent headwinds on some of the principal air routes of the world," *Great Britain. Meteorological Office, Meteorological Report* No. 7. 2) Estimates based on seasonal mean charts of standard isobaric surfaces up to 100 mb, and on standard vector deviations of wind measured by radar at Auckland and Nandi. Figures give equivalent head-winds likely to be exceeded on 50, 15 and 5% of occasions along each route. *Subject Headings:* **1. Upper air winds 2. Aeronautical meteorology 3. South Pacific.**—*G.J.E.*

4E–235 551.506.7

Germany. Deutsche Demokratische Republik, Meteorologischer und Hydrologischer Dienst, **Deutsches Meteorologisches Jahrbuch, 1951. Teil V. Höhenwindmessungen in Greifswald, Lindenberg, Dresden, Wernigerode, und Leipzig Mockau.** [German meteorological yearbook. Pt. V, Upper wind observations made at Greifswald, Lindenberg, Dresden, Wernigerode and Leipzig Mockau.] Berlin, **1952. DWB**—Daily upper wind observations from radiosonde ascents followed optically and from pilot balloons. Heights are given in hectometers, wind direction in degrees and speed in m/sec. *Subject Headings:* **1. Upper air wind observations 2. Germany.**—*G.J.E.*

4E–236 551.501.7:551.508.57:551.557

Godson, W. L., **The relative accuracy of rawins and contour-measured winds.** *Canada. Meteorological Div., Circular,* 2076, **1952.** 10 p. 9 refs. **DWB**—Relative accuracy of rawins and contour-measured winds assessed. Vector errors of contour-measured winds generally exceed those of rawins especially at stratospheric levels. Anticipated requirements for high level wind forecasts can only be met by an adequate network of radiosonde stations which supply data for isotach analyses and prognoses. *Subject Headings:* **1. Instrument accuracy 2. Upper air wind computation.**—*G.J.E.*

4E–237 551.506.7(42)

*Great Britain. Meteorological Office, **Upper air data for stations maintained by the Meteorological Office, 1946–50, Part I, Larkhill.** London, H.M. Stationary Office, **1952.** 52 p. mostly tables, 4 graphs. M.O. 555. **GB-MO**—Summaries and frequencies of height, temperature, humidity, and winds, for standard pressure surfaces and of temperature and pressure of tropopause for British stations making radiosonde and radar wind measurements. (This volume contains only Larkhill data.) Most of the data appear in graphic form as well as in contingency tables. (*Same item as* 4.3–45, March 1953, *MAB.*) *Subject Headings:* **1. Upper air data 2. Tropopause 3. Larkhill, England.**—*M.R.*

4E–238 551.557.36(43)

Guss, Hans and Holzapfel, Rupert, **Über den Höhenwind im Rhein-Main-Gebiet.** [Upper wind in Rhine-Main region.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte,* No. 42:433–440, **1952.** 2 figs., 2 tables. **DWB**—Summary of radio wind records at Wiesbaden 1948–52 with detailed tables of direction and speed for 850, 700, 500 and 300 mb. *Subject Headings:* **1. Upper air wind frequencies 2. Wiesbaden, Germany.**—*G.J.E.*

4E–239 551.557(51)

*Hay, R. F. M., **Wind at high levels over Hong Kong.** *Great Britain. Meteorological Research Committee*, M.R.P. 778, Dec. 4, **1952.** 6 p. 4 figs., 4 tables, 2 refs. Mimeographed. **DWB**—Radar and radiosonde winds 1950–51 are tabulated and graphed for 850–60 mb. Daily observations show almost abrupt change from mostly westerlies to easterlies at 100 mb in late May and back in early or mid October; at 150 and 200 mb duration of easterlies is shorter. Extremes were 123 knots from 268° and 78 knots from 40°. *Subject Headings:* **1. Upper air winds 2. Hong Kong.**—*C.E.P.B.*

4E–240 551.554:551.557.3(43)

Holzapfel, Rupert, **Über die Änderung der Windgeschwindigkeit mit der Höhe.** [On the change of wind velocity with height.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 42:252–255, **1952.** fig., 3 tables. **DWB**—Detailed statistical study of winds over Berlin to 7 km and relations to those at 1 km. *Subject Headings:* **1. Wind profiles 2. Upper air winds 3. Berlin, Germany.**—*C.E.P.B.*

4E–241 551.558.21:797.5(794)

Jones, Bascom, Jr., **Adventure with wind.** *Flying*, 51(2):12–13, 46, Aug. **1952.** 2 figs. **DLC**—A brief history of soaring with emphasis on the Sierra Wave. It is pointed out that occasionally the Wave reaches an altitude of 90,000 ft. Various soaring records are mentioned. *Subject Headings:* **1. Soaring 2. Sierra Wave 3. Lee waves 4. Upper air winds 5. California.**—*G.T.*

4E–242 551.511

†Kramer, Mollie P. and Rigby, Malcolm, **Selective annotated bibliography on atmospheric turbulence and "bumpiness" in flight.** *Meteorological Abstracts and Bibliography*, 3(11):1185–1219, Nov. **1952. MH-BH**—Annotated bibliography of 213 items contains many references to literature on high level turbulence. *Subject Headings:* **1. Atmospheric turbulence 2. Turbulence bibliographies 3. Bibliographies.**

4E–243 551.557.3:551.506.5(264)

*Kuhlbrodt, Erich, **Höhenwinde auf dem Seeweg Kapverdenregion–La Plata.** [Upper air winds on the ocean route between Cape Verde–La Plata.] *Geofisica Pura e Applicata*, 21:19–31, **1952.** 4 figs., 8 tables, refs. German and English summaries p. 19. **MH-BH**—Some partial results of analysis of upper air data collected by the German "Meteor" expedition and Deutsche Seewarte data presented to illustrate general air circulation on route to South America. Average wind elements and dispersion of velocities treated for the 4–5, 9–10 and 14–15 km levels. Air current stratification up to 15 km given with particular attention to seasonal characteristics of tropical easterlies and tropical west-wind layer of upper troposphere. (*Same item as* 3.11–164, Nov. 1952, *MAB.*) *Subject Headings:* **1. Marine meteorology 2. Upper air wind data 3. South Atlantic Ocean.**—*M.P.K.*

4E–244 52(083) 55(083) 551.501.4:551.557

*Landolt, Hans H. and Börnstein, Richard, **Zahlenwerte und Funktionen aus Physik, Chemie, Astronomie, Geophysik und Technik.** [Tables and equations in physics, chemistry, astronomy, geophysics and technology.] 6th ed. edited by Arnold Eucken. Berlin, Springer, **1950–1952.** v. 3, **Astronomie und Geophysik.** Prepared by George Joos; ed. by Julius Bartels and Paul ten Brüggencate. **1952.** 795 p. tables, charts, figs., bibliographies throughout. **DWB, DLC**—Meteorological section gives details of upper winds for 9 stations in Europe, three in North America, two each in South America, Asia and Africa, and one each in New Zealand and Hawaii. Mean wind speeds and directions given for each month. Heights vary with each station. Other tables give mean monthly and annual air transfer; percentage frequency of various wind directions for each month at heights up to 8 km over Berlin; mean wind speed for four wind directions for each month at various heights up to 5 km over Pavia and up to 3 km over Croydon; mean annual wind speed for four wind directions up to 4 km for 9 stations; frequency of the four wind directions in each season, given for certain speed limits and at various heights up to 5 km over Berlin. (*Same item as* 4.4–9, April 1953, *MAB.*) *Subject Headings:* **1. Meteorological tables 2. Upper air winds. I. Eucken, Arnold** (*ed.*) **II. Joos, George III. Bartels, Julius** (*ed.*) **IV. ten Brüggencate, Paul** (*ed.*). —*G.J.E.*

4E–245 551.506.1(54) 551.506.7(540):551.557

Pakistan. Meteorological Dept., **Upper air data. Monthly means of pilot balloon data 1948.** Karachi [1952]. **DWB**—First part gives monthly mean direction and speed of winds up to 9 km. Second includes same information for winds above 9 km. Means given for 17 stations including Bahrein (Persian Gulf). *Subject Headings:* **1. Annual meteorological reports 2. Upper air wind observations 3. Bahrein Island, Persian Gulf.**—*G.J.E.*

4E–246 551.501.7:551.508.57

Rapp, R. R., **The effect of variability and instrumental error on measurements in the free atmosphere.** *New York University. College of Engineering, Meteorological Papers*, 2(1), June **1952.** 41 p. 8 figs., 19 tables, 37 refs. Also as: New York University. College of Engineering, Research Div., Contract DA36-039-SC-72, Project 138, Variability of Upper Winds, Final Report, June 1, 1950–Feb. 28, **1952. DWB**—The variation of meteorological instruments discussed, and the word "variability" given a precise meaning. An experiment is designed to permit estimation of variance of observed winds and to provide a means of apportioning this variance. Results discussed in detail for temperature and height of standard isobaric surfaces and for wind components. *Subject Headings:* **1. Upper air computations 2. Upper air winds 3. Upper air wind measurement. I. New York University. College of Engineering. Research Div. II. Contract DA36-039-SC-72.**—*G.J.E.*

4E–247 551.506.7:551.557.2(931)

Row, Ann L., **Upper winds over Auckland.** *New Zealand. Meteorological Office, Circular Note*, No. 78, **1952.** 1 p.+5 tables. Mimeographed. **GB-MO**—Seven years of radar wind observations at Auckland used to derive monthly mean resultant winds and the seasonal frequency distribution, for 10,000, 18,000, 30,000 and 40,000 ft levels. (*Same as* 4D–266, April 1953, *MAB.*) *Subject Headings:* **1. Upper air wind frequencies 2. Auckland, New Zealand.**—*G.J.E.*

4E–248 551.524.7:551.547:551.557

Schmitt, W., **Preliminary mean absolute topography [at] 500 mb., Southern Hemisphere 70°W–120°E, summer 1951/52.** *South Africa. Weather Bureau, Notos*, 1(1):7–17, **1952.** 6 figs., 3 tables, 4 refs. **DWB**—Monthly and seasonal means of absolute topography at 500 mb given for summer 1951/52. A strong planetary frontal zone, above westerlies with an axis along 50°–55°S is the outstanding pattern. Average gradient within zone corresponds to 45 knots at 500 mb. Individual maps show gradients corresponding to 130 knots during meridional weather types. (*Same item as* 4.3–172, March 1953, *MAB.*) *Subject Headings:* **1. Constant pressure surfaces 2. Upper air winds 3. Gradient winds.**

1953

4E–249 551.513.2:551.557

Bannon, J. K. and Davis, N. E., **Atmospheric circulation at high altitudes in the tropics and subtropics.** *Meteorological Magazine*, London, 82(970):116–121, April **1953.** 6 refs. **DWB**—Charts of winds at 300, 200, 150 and 100 mb between 40°N and 40°S for Jan., April, July, Oct., based on radar or radio wind data, are described and use of vector wind variation as a means of statistical forecasting discussed. An informative discussion is summarized. *Subject Headings:* **1. Atmospheric circulation 2. Upper air winds.**—*C.E.P.B.*

4E–250 551.557.36:551.510.52/3(46)

Bannon, J. K. and Jackson, M. P., **Relation between tropopause and level of maximum wind at Gibraltar.** *Meteorological Magazine*, London, 82(970):100–102, April **1953.** 2 figs., table, ref. **DWB**—Pressure levels of maximum winds of 50 knots or more at Gibraltar are compared with pressure at tropopause. Little relation was found, but wind maximum averages about 40 mb below tropopause. *Subject Headings:* **1. Upper air wind variations 2. Tropopause 3. Gibraltar.**—*C.E.P.B.*

4E–251 551.557.36(51)

Bell, G. J. and Kwai, Luk-hung, **Upper winds determined by radar 1949 to 1951.** *Hong Kong. Royal Observatory, Technical Notes*, No. 5, Jan. **1953.** 3 p. 2 refs. **DWB**—Radar reflectors attached to radiosonde balloons were released daily at 8 a.m. local time with a lift of approximately 1200 ft/min. Monthly wind roses given for 11 heights between 1000 and 38,000 ft. For information of airline operators, winds greater than 27 knots at levels of 15,000, 22,000 and 30,000 ft have been further analyzed. Twenty-seven roses given for the additional speed ranges. Roses for June, July and Aug. not included because of the rare occasions of strong winds. Upper westerlies seen to be strongest during Jan., Feb. and March, generally exceeding 27 knots above 15,000 ft and increasing with height. *Subject Headings:* **1. Upper air wind frequencies 2. Hong Kong.**—*G.J.E.*

4E–252 551.557:629.13(98)

Bower, D., **Navigation on some recent R.A.F. flights in high latitudes.** *Institute of Navigation, Journal*, 6(2):148–158, April **1953.** 2 figs., table, 3 refs. **DWB**—Description of flights by R.A.F. Flying College from Reykjavik via Churchill or Resolute Bay to England, mostly in magnetic field <0.06 gauss. Navigation was by gyro compass, dead reckoning and wind finding, and astrofixing. Uncertainty of meteorological information is a serious obstacle. *Subject Headings:* **1. Aerial navigation 2. Upper air winds 3. Arctic.**—*C.E.P.B.*

4E–253 551.557.3:551.510.52/3

†Faust, Heinrich, **Die Nullschicht, der Sitz des troposphärischen Windmaximums.** [The zero layer, the site of the tropospheric wind maximum.] *Meteorologische Rundschau*, 6(1/2):6–15, Jan./Feb. **1953.** 12 figs., 3 tables, 57 refs. **DWB**—Deep pressure systems over central Europe change the sign of their vertical wind components at about 10 km, where the ageostrophic mass transport changes direction. This "null layer" which coincides with the subtropopause wind maximum, is at about 15 km in tropics (2 km below tropopause) to 8 km in 75°N (0.5 km below tropopause). It is the level of most rapid change of pressure surfaces and of great significance for the dynamics of weather. *Subject Headings:* **1. Upper air wind variations 2. Tropopause wind maximum.**—*C.E.P.B.*

SUPPLEMENTARY MATERIAL

4E–254 551.506.7:551.557:551.576(485)

Hildebrandsson, H. H., **Études internationales des nuages 1896–1897. Observations et mesures de la Suède.** [International cloud studies 1896–97. Observations and measurements made in Sweden.] Upsala, **1898.** 29+104+49 p. 3 plates. **GB-MO**—Detailed account of historical background of international agreement on cloud observations. Second part gives photographic observations of vertical and horizontal cloud movements and their heights and thicknesses. Several observations of cirrus give horizontal velocities in excess of 100 knots. Third part gives direction of movement of clouds as observed directly. *Subject Headings:* **1. Cloud observations 2. Cloud movement 3. Upper air winds 4. Sweden.**—*G.J.E.*

4E–255 551.557(71):551.576.5

*Canada. Meteorological Div., **Cloud observations during 1896 and 1897 at Toronto.** Ottawa, **1901.** 27 p. 11 tables, 2 figs. **GB-MO**—Photographic measurements of cloud heights and velocities presented in detail. Mean heights, velocities and frequencies given for April–Sept. and for Oct.–March, for each cloud type. Data are available up to 12 km. *Subject Headings:* **1. Cloud movement 2. Upper air wind data 3. Toronto, Canada.**—*G.J.E.*

4E–256 551.506.7:551.557:551.576(54)

*Hill, E. R., **Report on cloud observations and measurements in the plains of the North-Western Provinces of India during the period December 1898–March 1900.** *India. Meteorological Dept., Memoirs*, 9(3):253–302, **1899/1901.** 15 tables, 2 figs.—Details given of use of pairs of photogrammeters and Fineman nephoscope for investigating heights and movements of clouds at Allahabad. Individual results tabulated, and mean and extremes of heights and velocities given either by months or seasons—June to Oct., Nov. to May for each cloud type. *Subject Headings:* **1. Cloud data 2. Cloud movement 3. Upper air winds 4. India.**—*G.J.E.*

4E–257 551.506.7:551.557:551.576.5(729)

Bigelow, F. H., **Studies on the circulation of the atmospheres of the sun and of the earth. V. Results of the nephoscope observations in the West Indies during the years 1899–1903.** *Monthly Weather Review*, 32:166–169, **1904.** 40 figs. **DLC**—The results are given in pictorial form and discussed at some length. A maximum easterly velocity is seen at the cirrus level. The mean altitudes at which the westward drift reverses to an easterly is shown, and the winter and summer circulations are considered and shown diagrammatically at each cloud level. *Subject Headings:* **1. Cloud movement 2. West Indies.**—*G.J.E.*

4E–258 551.557:551.576.5(73/9)

Bigelow, F. H., **Studies on the circulation of the atmospheres of the sun and the earth. VII. The average monthly vectors of the general circulation in the United States.** *Monthly Weather Review*, 32:260–263, June **1904.** table, 3 charts. **DLC**—Wind vectors are given at the surface and low, medium and high cloud levels for 13 stations. Charts are used to show the annual variations. *Subject Headings:* **1. Cloud movement 2. Upper air wind charts 3. United States.**—*G.J.E.*

4E–259 551.506.7(47) 551.557.36

*Sresnevskiĭ, B. I., Polovke, I. and Sresnevskiĭ, I. B., **Aerologische Beobachtungen des Kiewer Meteorologischen Observatoriums, Pilotballonbeobachtungen 1918–1930.** [Aerological observations of the Kiev Observatory, pilot balloon observations 1918–1930.] *Akademiia Nauk, U.R.S.R., Kiev. Prirodnicho-Tekhnichniĭ Viddil, [Memoires]* No. 3, **1931.** 65+p. all tables. In Ukrainian and German.—Results of pilot balloon observations, 1918 and 1930, analyzed. Frequencies of wind directions and mean annual wind speeds given to 16 km and compared with similar values for Vienna. *Subject Headings:* **1. Upper air wind data 2. Upper air wind frequencies 3. Kiev, U.S.S.R. 4. Vienna, Austria.**—*G.J.E.*

4E–260 551.557(43)

Reger, J., **Die mittleren Windverhältnisse über Lindenberg nach Registrierballon-Aufstiegen.** [Mean wind conditions above Lindenberg from registering balloon ascents.] *Beiträge zur Physik der freien Atmosphäre*, 20:274–280, **1933.** 2 figs., 3 tables. **DLC**—Mean wind speeds and wind vectors given to a height of 20 km. Accuracy with which wind values in troposphere can be determined from place of fall of balloons discussed. *Subject Headings:* **1. Upper air winds 2. Lindenberg, Germany.**—*G.J.E.*

4E–261 551.557.36(467)

*Guardiola, J. M. J., **Notas para una climatología de Menorca (Islas Baleares). Vientos en altura.** [Note on the climatology of Minorca (Balearic Islands). Upper winds.] *Spain. Servicio Meteorológico Nacional, Publicaciónes, Ser. A, Memorias*, No. 12, **1943.** 49 p. numerous tables, figs. **MH-BH**—Annual frequencies of wind direction and mean speeds for each direction given to height of 8,000 m. *Subject Headings:* **1. Upper air wind frequencies 2. Minorca, Balearic Islands.** —*G.J.E.*

4E–262 551.557

Palmer, C. E., **Upper winds at Little America on November 29, 1929.** *New Zealand. Meteorological Office, Note*, No. 26, **1943.** Also: *Royal Society of New Zealand, Transactions*, 72(4):311–323, **1943.** 8 figs., 6 refs. **DWB**—Pilot balloon data analyzed to show percentage frequencies of different wind directions at surface, 2.5 km, 5 km and 10 km (fig. 1). Easterly winds surprisingly frequent. Suggested that surface anticyclones are also more common than the polar vortex theory would imply. *Subject Headings:* **1. Upper air winds 2. Polar vortexes 3. Little America 4. Antarctica.**—*M.P.K.*

4E–263 551.501.7:551.508.57 621.396.9

Great Britain. Meteorological Office, **Measurement of upper wind by radar methods.** London, **1944.** 14 p. 3 figs., 4 appends. Rev. 2nd ed., **1945.** 16 p. 4 figs., 6 appends. M.O.M. 468. **GB-MO**—Brief elementary exposition of radar is followed by descriptions of G.L. (Gun Laying) Mark II and Mark III radar sets. Methods of use of each set for measuring winds presented. Second edition describes G.L. Mark III modifications. Additional appendices give instructions for use of albino balloons and for adjusting the range-doubler unit. *Subject Heading:* **1. Radar wind measurement.**—*G.J.E.*

4E–264 551.501.8:551.508.822:551.557

Great Britain. Meteorological Office, **Meteorological Office radio-sonde. Measurement of upper wind (radio-wind).** London, **1943.** 58 p. 19 figs., 8 appends. M.O. 464. **Appendix IX.** London, **1945.** 8 p. M.O. 464/9. **GB-MO**—General account of the radio wind measurement in use in Britain in 1942. Functions of the three D/F stations outlined and a scale diagram given of such a station. Append. I gives instructions for assembling and testing a D/F set. Other appendices include detailed accounts of the dual purpose portable transmitter, telephone equipment, and methods of plotting, smoothing, estimation of accuracy and location of sources of site error The separately published Append. 9 is a note on D/F errors. Simple theoretical treatment given of the effect of a number of signals arriving simultaneously from different directions and in different phases. *Subject Headings:* **1. Radiosondes 2. Radio wind measurement.**—*G.J.E.*

4E–265 551.524.7 551.557.36

Abild, Bruno, **Temperatur und Wind in der unteren Stratosphäre im Sommer 1947.** [Temperature and wind in the lower stratosphere during the summer 1947.] *Annalen der Meteorologie*, 1(3):70–75, March **1948.** 7 figs., 3 tables, 10 refs. **DWB**—Frequency of winds with easterly or westerly components and of specified values given for heights between 12 km and 19.5 km at Husum. Winds at 13.5 and 18 km levels compared. *Subject Headings:* **1. Upper air temperatures 2. Upper air wind frequencies 3. Husum, Germany.**—*G.J.E.*

4E–266 551.553.57:551.501.7

Pramanik, S. K., **Computation of winds in the atmosphere in low latitudes.** *India. Meteorological Dept., Scientific Notes*, 10(127):153–156, **1948.** 2 tables, 3 eqs. **DWB**—Brief discussion of method of computing upper air winds from radiosonde and airplane reports of temperatures and pressures aloft. Tables included provide for correction to be applied to geostrophic wind to obtain gradient wind. *Subject Headings:* **1. Upper air wind computation 2. India.**—*M.P.K.*

4E–267 551.557.36(689.1)

Sellick, Noel Parkin, **High winds over Southern Rhodesia.** *Weather*, 5(2):67, Feb. **1950. DWB**—Fairly high frequency of westerly winds in excess of 40 knots shown by earlier pilot balloon observations are confirmed by the 130 radiosonde ascents observed by theodolite between April 1947 and March 1949. In summer (Nov.–March) winds in excess of 40 knots are infrequent and do not appear much below 30,000 ft. Direction variable. In winter (April–Oct.) such winds are

frequently observed, occasionally as low as 20,000 ft and invariably have a westerly component. *Subject Headings:* **1. Upper air wind frequencies 2. Southern Rhodesia.**—*G.J.E.*

4E–268 551.557

Kobayashi, Y., **On the zonal-component of upper wind at Tateno.** *Tateno, Japan. Aerological Observatory, Journal,* 5(1):37–41, March **1951.** 3 figs. English summary p. 37. **DWB**—Theodolite and radio-tracking observations from Sept. 1949 to Sept. 1950 used to investigate annual variation of zonal component of wind. Strongest westerlies (>70 m/sec) were observed in Jan. at 12 km. In July and Aug. zonal component at this height was zero and easterlies were observed in lower levels. Most interesting are well developed easterlies in stratosphere during this time. *Subject Headings:* **1. Upper air winds 2. Atmospheric circulation 3. Tateno, Japan.**—*A.A.*

4E–269 551.552:551.509.52:551.557

*U. S. Bureau of Aeronautics (Navy), **Trajectory and wind-field forecasting techniques for high-level operations.** Project AROWA (TED-UNLMA-501. 19), First Progress Report, July 1, **1952**–Jan. 31, **1953.** 24 p. 3 refs. Append. A: Wobus, Hermann B., **Constant vorticity trajectories by a specially designed differential analyzer.** 12 p. 6 figs., 2 refs. Append. B: **Constant absolute vorticity trajectory tables.** 3 p. tables, fig. **DWB**—First report on investigation of "existing trajectory forecasting techniques and development of an acceptable technique for forecasting trajectories at various constant-pressure surfaces up to 60,000 ft or higher." Construction of a model electromechanical computer (the AROWAGON) is first step toward solving problem of determining the relationship between trajectories, horizontal pressure gradient and other meteorological variables. Next step will be the "compilation and dissemination of the trajectories obtained from various specified types of pressure patterns." Append. A consists largely of a description of the use of the Wiggle-Wagon, a specially designed differential analyzer, for drawing trajectories directly on constant-pressure charts. Append. B contains tables giving "principal dimensions of the trajectories derived from ROSSBY's formula: $V/R+f$=constant, where V is wind speed, R is radius of trajectory curvature and f is Coriolis force." *Subject Headings:* **1. Trajectory forecasting 2. Wind fields 3. Upper air wind forecasting. I. Project AROWA (TED-UNL-MA-501.19) II. Wobus, Hermann B.**—*M.P.K.*

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*Matuoka, Y., **The statistics of the winds aloft over Honjo.** *Tateno, Japan. Aerological Observatory, Journal,* 5(2):103–123, Jan. **1953.** 6 figs., 7 tables. In Japanese, English summary p. 103. **DLC**—An elaborate statistical study of double theodolite observations up to 13 km for Honjo, Japan. Average E–W and N–S components and the transport of air are calculated from the density and wind velocity. Harmonic analysis of the annual variations of flux of air at 1, 2, 4, 6, 8, 10, 12 and 13 km are tabulated and shown graphically. Annual variations of the eastward and southward fluxes of air are also shown graphically for each 2 km level. Number of observations, frequency of E and S component in percent, resultant wind direction and velocity as well as the above mentioned quantities are presented in tables for each 0.2 km level for each month. *Subject Headings:* **1. Upper air wind data 2. Statistical studies 3. Honjo, Japan.**—*M.R.*

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section are for information only, and will not be listed in the monthly author or subject indexes. If not abstracted during the year they will be cited in the annual Cumulative Author Index. When material is furnished in advance of date of publication, the pagination may be omitted.

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Johnson, Francis S.: **High altitude diurnal temperature changes due to ozone absorption,** p. 106–110.

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Petrie, W.: **Auroral studies at the University of Saskatchewan,** p. 254–255.

Davies, Frank T.: **Visual auroral observations in Canada, 1943–1947,** p. 255–273.

Great Britain, p. 274–275.

Veldekamp, J.: **Auroral observations in the Netherlands, 1939–1948,** p. 275.

Baird, H. F.: **Christchurch Magnetic Observatory auroral program,** p. 276–277.

Atkinson, H. R.: **Catalog of aurora australis displays over Canterbury, New Zealand, 1946–47,** p. 277–284.

Thomson, I. L.: **Report on New Zealand work on the aurora australis,** p. 285–286.

Störmer, Carl: **Report on aurora work since 1939,** (Norway), p. 286–288.

Götz, F. W. P.: **Auroral report,** (Switzerland), p. 288–289.

Gartlein, C. W.: **Report of work on aurora since 1939** (U.S.A.), p. 290–292.

Vestine, E. H.: **Report on auroral work of the Department of Terrestrial Magnetism, Carnegie Institution of Washington, since 1939,** p. 293.

Parkinson, W. D.: **Review of the literature on the ion balance of the lower atmosphere since 1939,** p. 307–313.

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Fleming, J. A.: **Progress-report of the joint Committee of the Commission of Terrestrial Magnetism and Atmospheric Electricity of the International Meteorological Organization and the Association on Methods and Codes to adequately describe magnetic disturbances and perturbations,** p. 341–342.

Appleton, E. V.: **Joint Committee of the Association of Terrestrial Magnetism and Electricity and of the International Scientific Radio Union of the Ionosphere,** p. 343.

Chapman, S.: **Report on international collaboration to advance the study of the moon's effect upon geophysical phenomena,** p. 343–345.

Parkinson, Wilfred C.: **Solar flares and their terrestrial effects,** p. 357.

Nicolet, M.: **Le problème des régions ionosphériques,** [The problem of ionospheric regions], p. 357.

Yonezawa, T.: **On the variations of electron and ion densities in the F_2 layer at the time of the solar eclipse on February 5, 1943,** p. 358–360.

Nagaoka, Hantaro: **Magnetic storms and lunar phase during sunspot maximum from standpoint of ionospheric disturbances,** p. 360.

Gherzi, Fr. F.: **Results of some ionospheric and solar radio noise researches made at Zi-ka-wei Observatory during the solar annular eclipse of May 9, 1948,** p. 360–362.

Nagata, T.: **Longitudinal inequality of solar diurnal variation in geomagnetic field,** p. 362–364.
Nagaoka, Hantaro: **Magnetic disturbance during sudden fadeouts of radio transmission,** p. 365.
Imamiti, S.: **Radio fadeout and earth magnetic variation,** p. 365.
Wells, H. W.: **Rapid changes in the ionosphere,** p. 369–370.
Wells, H. W.: **High-speed ionospheric recording technique,** p. 370–371.
Berkner, L. V.: **Continuous recording of dominant ionospheric characteristics,** p. 371–372.
Wells, H. W.: **Characteristics of sporadic E,** p. 372–373.
Meek, J. H.: **Characteristics of E-region sporadic ionization in Canada,** p. 373–379.
Uyeda, H.: **Change in the E-region in the morning and in the evening,** p. 379.
Wells, H. W.: **Ionospheric observatories established by the Department of Terrestrial Magnetism, Carnegie Institution of Washington,** p. 380.
Wells, H. W.: **Ionospheric anomalies and future research objectives,** p. 380.
Burkard, Otto: **Elektronenvernichtung in der F2-Schicht,** [Elimination of electrons in the F2-layer], p. 381–385.
Uyeda, H.: **Worldwide distribution of the ordinary component critical frequencies of F2-layer,** p. 385–388.
Aono, Y.: **On the variation of minimum frequency in h'-f curve of ionospheric observation,** p. 388–389.
Nakata, Y.: **Formation of F12-layer,** p. 389.
Nagaoka, Hantaro: **Diurnal variation in the production of ions in the ionosphere,** p. 389.
Nagaoka, Hantaro: **The formation of F1- and F2-layers of the ionosphere,** p. 389.
Nagaoka, Hantaro: **Six month period of terrestrial magnetic activity and its relation to F2-layer of the ionosphere,** p. 390.
Nagata, T. and Fukushima, N.: **Ionospheric bays accompanying geomagnetic bays,** p. 390–391.
Davies, Frank T.: **Visual auroral observations in Canada, 1943–47,** p. 464.
Nagaoka, Hantaro: **Magnetic disturbance during sudden fadeouts of radio transmission,** p. 365.
Imamiti, S.: **Radio fadeout and earth magnetic variation,** p. 365.
Vestine, E.H.: **Analyses of visual observations of aurora,** p. 465.
Nicolet, M. and Dogniaux, R.: **Nouvelles suggestions au sujet de l'interprétation du spectre des aurores,** [New suggestions on the problem of interpretation of the auroral spectrum], p. 465–466.
Penn, W. D. and Currie, B. W.: **A recording meter for auroral radiations,** p. 466.
Petrie, William: **Remarks on the excitation of hydrogen and helium in the upper atmosphere,** p. 466–470.
Malmfors, K. F.: **Model experiment on the aurora,** p. 470–471.
Currie, B. W.: **Report on auroral investigations at the University of Saskatchewan, Canada,** p. 471–473.
Kaplan, Joseph: **Laboratory studies related to the physics of the upper atmosphere,** p. 474–479.
Vegard, L.: **Properties of the upper atmosphere revealed through spectral analyses of aurorae and twilight,** p. 479–490.
Gartlein, Carl W.: **Aurora spectra showing broad hydrogen lines,** p. 491–492.
Ramanathan, K. R. and Karandikar, R. V.: **Recent work on the measurement of atmospheric ozone and its vertical distribution in India,** p. 492–494.
Ellyett, C. D. and Lovell, A. C. B.: **Radio studies of meteoric ionization,** p. 494.
Millman, M. and McKinley, W. R.: **The correlation of visual meteor data with the character of meteor radar echoes,** p. 494–495.
Nagaoka, Hantaro: **Luminescence and ionization of meteors,** p. 496.
Link, F.: **Exploration météorique de la haute atmosphère,** [Meteoric exploration of the upper atmosphere], p. 496–499.
Berkner, L. V. and Vestine, E. H.: **Measurement of the geomagnetic field in the ionosphere,** p. 499–500.
Newell, H. E.: **Upper atmosphere research with V-2 rockets,** p. 500.
Vestine, E. H.: **Rocket measurements of the geomagnetic field and heights of electric current-systems in the atmosphere,** p. 500–501.
Langille, R. C.: **The scattering of ten centimeter radio waves by rain,** p. 501.
Link, F.: **Sondages optiques de la haute atmosphère à l'aide des éclipses de lune,** [Optical soundings in the upper atmosphere with the aid of lunar eclipses], p. 502–503.
Link, F.: **Sur la possibilité des sondages optiques de la haute atmosphère à l'aide des phénomènes crépusculaires,** [On the possibility of optical soundings in the upper atmosphere with the aid of crepuscular phenomena], p. 504–506.
Nagaoka, Hantaro: **Sudden fade-out of high frequency electric waves caused by alpha particles formed in the uppermost atmosphere,** p. 507.
Hasegawa, M.: **A suggestion for the electric conductivity of the upper atmosphere from an analysis of the diurnal variations of terrestrial magnetism,** p. 507–510.

Koono, T.: **Meteoric impact ionization observed on radar oscilloscopes,** p. 510.
Hulburt, E. O.: **The brightness and polarization of the daylight sky,** p. 510.
Gish, O. H. and Wait, G. R.: **Electrical surveys over thunderheads,** p. 510–511.
Smosarski, W.: **Quelques results des observations simultanées du champ électrique de la conductibilité et des phénomènes météorologiques,** [Simultaneous observational results of the electric field of conductivity and meteorological phenomena], p. 513.
Sekido, Yataro: **An abstract of geophysical research of cosmic rays in Japan,** p. 513–515.
Yonezawa, T.: **On the reflection of radio waves from a meteor,** p. 516–518.
Kimpara, A.: **The wave form of atmospherics,** p. 518.
Schove, D. Justin: **The phase of the sunspot cycle through the centuries,** p. 518.
Forbush, S. E.: **Summary of cosmic-ray investigations,** p. 529–531.
Van Allen, James A.: **The use of rockets in upper atmospheric research,** p. 531–536.
Bricard, J.: **L'équilibre ionique de la basse atmosphère,** [Ionic equilibrium in the lower atmosphere], p. 536.

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Chapman, Sydney: **The geometry of radio echoes from aurorae,** p. 1–29.
Weiss, A. A.: **Solar ionospheric tides in the F_2 region,** p. 30–40.
Landseer-Jones, B. C.: **The streaming of charged particles through a magnetic field as a theory of the aurora,** p. 41–57.
Osborne, B. W.: **Some practical determinations of the electron content below the level of maximum ionization in the F_2 region of the ionosphere,** p. 58–67.

Journal of Atmospheric and Terrestrial Physics, London, Volume 3, Number 2, February 1953.

Findlay, J. W.: **Moving clouds of ionisation in region E of the ionosphere,** p. 73–78.
Jones, R. E., Millman, G. H. and Nertney, R. J.: **The heights of ionospheric winds as measured at long radio wavelengths,** p. 79–91.
Nertney, R. J.: **The lower E and D region of the ionosphere as deduced from long radio wave measurements,** p. 92–107.
Atlas, David, Kerker, Milton and Hitschfeld, Walter: **Scattering and attenuation by non-spherical atmospheric particles,** p. 108–119.
Rawer, K., Minnis, C. M.: **Note on the longitude effect in the F-region,** p. 123–124.
Appleton, V. Edward and Piggott, W. Roy: **Ionospheric storms and the geomagnetic anomaly in the F_2 layer,** p. 121–123.

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Charney, J. G. and Philips, N. A.: **Numerical integration of the quasi-geostrophic equations for barotropic and simple baroclinic flows,** p. 71–99.
Kaplan, Lewis D.: **Regions of validity of various absorption-coefficient approximations,** p. 100–104.
Stern, Melvin E. and Malkus, Joanne Starr: **The flow of a stable atmosphere over a heated island, Part II,** p. 105–120.
Singer, Irving A. and Smith Maynard E.: **Relation of gustiness to other meteorological parameters,** p. 121–126.
Rubin, Morton J.: **Seasonal variations of the Antarctic tropopause,** p. 127–134.
Hess, Seymour L. and Frank, Robert M.: **A theory of the temporal and latitudinal distribution of temperature,** p. 135–142.
Atlas, David and Bartnoff, Shepard: **Cloud visibility, radar reflectivity, and drop-size distribution,** p. 143–148.
Gates, Lawrence W.: **A method of numerical forecasting by juxtaposition of one-dimensional solutions, and its application to the equivalent barotropic model,** p. 161–164.
McDonald, James E.: **Remarks on "Atmospheric salt particles and raindrops." Reply by A. H. Woodcock,** p. 165–166.
Birstein, Seymour J. and Anderson, Charles E.: **Preliminary report on sea salt as an ice nucleus,** p. 166.

Meteorological Magazine, London, Volume 82, Number 971, May 1953.

Murray, R.: **Jet streams over the British Isles during June 14–18, 1951,** p. 129.
Carapiperis, Leon N.: **Diurnal variation of relative humidity on sea-breeze days in Athens,** p. 140.
Frankcom, C. E. N.: **"Selected" ships,** p. 146.

Scutt, R.: **Rare mock sun seen from Gresford, Denbigshire,** p. 155.
Glasspole, J.: **Frequency of cloud at mountain summits,** p. 156.
Thick fog, December 7, 1952, p. 158.
Rime, December 7, 1952, p. 158.
Weather of March 1953, p. 158.
Rainfall of March 1953, p. 160.

La Météorologie, Paris, July/September 1952.

La Société Météorologique de France (1852–1952), [Meteorological Society of France (1852–1952], p. 107–108.
Compte rendu des manifestations (17, 18, 19 avril 1952), [Transactions of the program (April 17, 18, 19, 1952], p. 109–112.
Allocution de M. Max Hymans, [Speech of Max Hymans], p. 113–116.
Causerie de M. J. Sanson, en la chapelle du château de Versailles: Trilogie météorologique versaillaise, [Speech of J. Sanson at the church of Chateau de Versailles: Meteorological trilogy of Versailles], p. 117–122.
Exposé de M. A. Viaut: La météorologie et les missions lointaines, [Speech of A. Viaut: Meteorology and distant assignments], p. 123–130.
Présentation de films sur les Expéditions polaires, par M. A. F. Liotard, [Film presentation of Polar Expeditions by A. F. Liotard], p. 131.
Exposé de MM. A. Prudhomme et A. H. Boujon: Sur les tempêtes observées en Terre Adélie, [Speech of A. Prudhomme and A. H. Boujon: Storms observed in Terre Adélie], p. 132–140.

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Flohn, Hermann: **Die Revision der Lehre vom Passatkreislauf,** [Revision of the theory of the trade wind circulation], p. 1–6.
Gressel, W.: **Die Bedeutung der Mittelmeerdepressionen in der alpinen Wettervorhersage,** [The importance of Mediterranean depressions in alpine weather forecasting], p. 15–18.
Maier, Wilhelm: **Asterismus an Hagelkörnen,** [Asterism in hail-stones], p. 18–19.
Troeger, Heinz: **Der Einfluss der Sonnentätigkeit auf die Witterung,** [The influence of solar activity on weather], p. 19–20.
Faust, Heinrich: **Erfahrungen mit Karten der Verdunstungslabilität (Sommer 1951),** [Experiments with charts of evaporation lability (summer 1951)], p. 20–24.
Heybrock, W.: **Luftspielungen in Marokko,** [Mirages in Morocco], p. 24–25.

Meteoros, Buenos Aires, Volume 2, Number 3/4, July/December 1952.

Schneider, Otto: **Acerca de la variación geomagnética de días tranquilos, en pilar,** [On the geomagnetic variation of quiet days], p. 149–165.
Celeste, Raimundo: **Contribución al conocimiento sísmico de la Provincia de Mendoza,** [Contribution to the seismic knowledge of the Province of Mendoza], p. 166–181.
Georgii, Walter: **Regulación del tiempo por la doble onda diaria de la presión atmosférica, en Mendoza,** [Weather changes in Mendoza due to the semi-diurnal atmospheric pressure], p. 182–189.
Dedebant, Georges and Machado, Emilio A. M.: **Cálculo del promedio mensual de temperatura en base a las tridiurnas,** [Calculation of the monthly mean temperature from thrice daily synoptic observations], p. 190–203.
Raffo, Jose Maria: **Pronóstico de crecientes del Río Chubut,** [Predicting the rise of water level in the Chubut River], p. 204–208.
Colqui, Benito S. and Madejski, Mariano E.: **Contribución al estudio del Glaciar Torrecillas (Lago Menéndez, Chubut),** [Contribution to the study of the Torrecillas Glacier, Menéndez Lake, Chubut], p. 209–214.
Burgos, Juan Jacinto: **El termoperiodismo como factor bioclimatico en el desarrollo de los vegetales,** ["Thermoperiodism" as a bioclimatic factor in the growth of plants], p. 215–242.
Marchetti, Adolfo A.: **Estudio del regimen pluviometrico de la Republica Argentina,** [Study of the rainfall regime of Argentina], p. 243–309.

Monthly Weather Review, Volume 81, Number 1, January 1953.

Lott, George A.: **An extraordinary rainfall centered at Hallett, Okla.,** p. 1–10.
Gifford, Frank, Jr.: **An alignment chart for atmospheric transmission of solar radiation,** p. 11.
Norton, Grady: **Hurricanes of 1952,** p. 12–15.
Smith, Kenneth E.: **The weather and circulation of January 1953,** p. 16–19.

Hughes, Grover D. and Roe, Charlotte L.: **Heavy rainfall during mid-January along the Pacific,** p. 20–25.
Johnson, Ernest C. and Mook, Conrad P.: **The heavy snowstorm of January 28–30, 1953 at the eastern end of Lake Ontario,** p. 26–30.

Monthly Weather Review, Volume 81, Number 2, February 1953.

Arakawa, H. and Suda, K.: **Analysis of winds, wind waves, and swell over the sea to the east of Japan during the typhoon of September 26, 1935,** p. 31–37.
Paulhus, J. L.: **Record snowfall of April 14–15, 1921, at Silver Lake, Colorado,** p. 38–40.
Forst, Albert L.: **Remarks on "On thunderstorm forecasting in the Central United States,"** p. 40–42.
Smith, Kenneth E.: **The weather and circulation of February 1953,** p. 43–46.
Jones, Alan H. and Roe, Charlotte L.: **The northern Gulf low of February 14, 1953,** p. 47–52.

Nimbus La Paz, Volume 3, Number 10/11, July/December 1952.

Antezana O., Octavio: **Importancia agricola de la meteorologia,** [Agricultural importance of meteorology], p. 3–10.
Howell, Wallace E.: **El tiempo local en el Valle del Chicama,** [Local weather in Chicama Valley], p. 11–23.
Cueto Jimenez, Hector: **Variaciones seculares de la temperatura en La Paz,** [Secular variations of temperature in La Paz], p. 24–26.
Annis, M. and Harmon, N. F.: **Decaimiento en vuelo de los mesones Tau,** [Decrease in flight of Tau mesons], p. 27–30.
Escobar V., Ismael: **La radiacion cosmica y su origen,** [Cosmic radiation and its origin], p. 31–40.

Rivista di Meteorologia Aeronautica, Rome, Volume 12, Number 3, July/September 1952.

Gazzola, Adriano: **Temporali frottali sull'Italia nord-occidentale,** [Frontal thunderstorms over northwest Italy], p. 3–17.
Mosetti, Ferruccio: **Le onde microbariche,** [Microbaric wave], p. 18–35.
Bernacca, Edmondo: **Il tempo in Italia nel trimestre Aprile-Guino 1952,** [Weather conditions in Italy during April–June 1952], p. 36–37.

Royal Meteorological Society, Quarterly Journal, Volume 79, Number 340, April 1953.

Manley, Gordon: **Reviews of modern meteorology—9. Climatic variation,** p. 185–209.
Berson, F. A.: **A quantitative analysis of the evolution of large-scale flow with regard to the effect of eddy motion,** p. 210–223.
Batchelor, G. K.: **The conditions for dynamical similarity of motions of a frictionless perfect-gas atmosphere,** p. 224–235.
Murray, R. and Daniels, Sylvia M.: **Transverse flow at entrance and exit to jet streams,** p. 242–261.
McIntosh, D. H.: **Annual recurrences in Edinburgh temperature,** p. 262–271.
Brown, P. R.: **Climatic fluctuations in the Greenland and Norwegian Seas,** p. 272–281.
Goody, R. M.: **Equations of transfer for the total flux of terrestrial radiation,** p. 282–283.
El-Fandy, M. G.: **On the physics of dusty atmospheres,** p. 284–287.
Malkus, Joanne S., Scorer, R. S. and Ludlam, F. H.: **Bubble theory of penetrative convection,** p. 288–292.
Björgu, O.: **The derivation of the logarithmic velocity profile,** p. 292–293.
Clodman, J.: **Critical values of the Richardson number,** p. 293–294.
Gregory, S.; Read, R. S.; Reynolds, G.: **Rainfall at Bidston, 1867–1951,** p. 294–295.
Hawke, E. L.: **Major H. C. Gunton, M.B.E., F.R. Ent. Soc.,** p. 314–315.

Weather, London, Volume 8, Number 4, April 1953.

Dexter, R. V.: **The mystery of heateorology** (*sic*), p. 99–101.
Reynolds, G.: **Storm-surge research,** p. 101–107.
Jensen, H. A. P.: **Tidal inundations past and present,** p. 108–113.
Readers' forum, p. 113.
The weather of March 1953, p. 114–115.
v. Ufford, H. A. Quarles: **The disastrous storm surge of 1 February,** p. 116–120.
Hawke, E. L.: **Midsummer snow on Braeriach,** p. 121.

Weatherwise, Volume 6, Number 2, April 1953.

Byers, Horace R.: **The new science of industrial meteorology**, p. 29, 57.
Reichelderfer, Francis W.: **The United States Weather Bureau and industry**, p. 31, 32, 62.
Copeland, John A.: **The gold mine at Asheville**, p. 33, 57.
Collins, George F.: **Meteorology in a chemical industry**, p. 34–35.
Seabrook, John M.: **Applied climatology at Seabrook Farms**, p. 36–37, 59.
Glenn, Alfred H.: **Weather and oil**, p. 39, 58.
Fritz, L. G.: **The airline meteorologist**, p. 40–41.
Steele, Thornton A.: **A department store uses weather**, p. 42–43.
Colean, Miles: **A magazine does something about the weather**, p. 44–45, 62.
Sargent, Frederick, II: **Meteorology and preventive medicine**, p. 47–48, 58.
Smith, Charles Pennypacker: **Meteorology in a public utility**, p. 49–50.
Senter, William O.: **Climatology applied by the air force**, p. 51–52.
Hanselman, Michael: **Steel**, p. 53.
Ludlum, David M.: **A mild winter across the nation**, p. 54–56.

PART IV. AUTHOR AND SUBJECT INDEX

In this section will be found reference to the numbers given at the head of each abstract or entry. In Part I each entry begins with the number 4.5–, and in the bibliography on Upper Level Winds (Part II) each entry begins with the number and letter 4E–. This index is divided into three parts:

Index of Authors Index of Subjects Index of Geographical Locations

INDEX OF AUTHORS

Abild, Bruno, 4E–265
Ailleret, P., 4.5–140
Akademiia Nauk SSSR, Kommissiia po Izucheniiu Iakutskoĭ Avtoiomnoĭ Sovetskoĭ Sotsialisticheskoĭ Respubliki, 4E–38
Alder, John E., 4.5–112
Alfrey, G. F., 4.5–226
Algeria. Service Météorologique, 4E–51, 4E–180
Algiers. University. Institut de Météorologie et de Physique du Globe, 4E–51, 4E–114
Alisov, B. P., 4.5–208
Allen, C. W., 4.5–116
Amateur Weathermen of America, Philadelphia, 4.5–30
Amateur Weatherman's Almanac, 4.5–30
American Institute of Crop Ecology, Wash., D. C., 4.5–213
Ando, T., 4.5–103
Angervo, J. M., 4.5–166
Apia. Observatory, 4E–204
Arakawa, Hidetoshi, 4.5–93, 4E–205
Armstrong, G. R., 4E–172
Armstrong, Terrence, 4.5–119
Arnoux, J., 4E–164
Ashwell, P. C., 4.5–241
Assmann, R., 4E–2
Atanasijević, Ivan, 4.5–118
Aujeszky, László, 4.5–23
Austin, E., 4E–32
Australia. Meteorological Branch, 4E–206, 4E–226
Australia. Royal Australian Air Force. Meteorological Services, 4E–132

Bailey, D. K., 4.5–236
Baker, W. G., 4.5–84
Bamford, J. A., 4E–10
Banfield, H. E., 4E–58
Bannon, J. K., 4E–181, 4E–207, 4E–249, 4E–250
Barbe, G., 4E–105
Barlow, E. W., 4.5–43, 4E–20
Bartels, Julius (*ed.*), 4E–244
Bateman, R., 4.5–236
Batty, R. P., 4.5–27
Beach, N. E., 4.5–42
Beals, E. A., 4E–27
Beebe, Robert G., 4.5–69
Behr, A., 4.5–248
Belgian Congo. Service Météorologique, 4E–208
Belgium. Institut Royal Météorologique, 4E–165
Bell, E. E., 4.5–47
Bell, G. J., 4E–251
Bellisario, Amerigo, 4.5–14
Benoliel, Robert W., 4.5–82
Berg, Hellmut, 4E–153, 4E–166
Bergeiro Hargain, José M., 4.5–44, 4.5–216
Berggren, Roy, 4E–227
Berkner, L. V., 4.5–236
Bezverkhniĭ, Sh. A., 4.5–60
Bhandari, N. N., 4.5–218
Bigelow, F. H., 4E–257, 4E–258
Bigler, S. G., 4E–171
Bindon, H. H., 4E–182, 4E–183
Bizov, N. P., 4E–34
Bjerknes, J., 4E–87
Bleasdale, A., 4.5–151
Bleeker, Wouter, 4E–78, 4E–79
Blue Hill Meteorological Observatory, 4.5–32
Blum, E. J., 4.5–117
Börnstein, Richard, 4E–244
Booker, Henry G., 4.5–237
Bossolasco, Mario, 4E–65, 4E–184, 4E–185
Bowen, W. A., 4.5–84
Bower, D., 4E–252
Bowles, K., 4.5–233
Braak, Cornelius, 4E–13
Bricault, R., 4.5–165
British Polar Year Expedition to Fort Rae, N.W. Canada, 1932–33, 4E–91
British West Africa. Meteorological Services, 4.5–192
Brocks, Karl, 4.5–221
Brooks, C. E. P., 4E–66, 4E–88, 4E–139, 4E–186
Brooks, Charles F., 4.5–32
Brown, Hanbury R., 4.5–253
Browne, L. C., 4.5–241
Bruzon, E., 4E–187
Budyko, M. I., 4.5–1
Bulgaria. Service Météorologique de l'Aviation Bulgare, 4E–57

LIST OF PERIODICALS

Note: This list contains the titles of the periodicals which regularly contain material on meteorology or related fields and it comprises only a small percentage of the periodicals from which pertinent articles are abstracted.

In this list the preferred form of title entry is given in bold face type. If the title is distinctive, the name and headquarters of the issuing society or organizations follows the title. If the title is not distinctive (for instance, Bulletin, Journal, Trudy, Mitteilungen), the entry consists of the issuing body followed by the title.

PERIODICALS IN WHICH METEOROLOGICAL ARTICLES REGULARLY APPEAR

Académie des Sciences, Paris, Comptes Rendus.
Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. and **Ser. Geofiz.**, [Moscow].
American Geophysical Union, Transactions, National Research Council, Washington.
★**American Meteorological Society, Bulletin,** [Boston].
★**Angewandte Meteorologie,** [Potsdam].
★**Annalen der Meteorologie,** Meteorologisches Amt für Nordwestdeutschland, Hamburg.
Annales de Géophysique, Centre National de la Recherche Scientifique, [Paris].
★**Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A** and **Ser. B,** [Vienna].
Australian Journal of Scientific Research, Ser. A, Physical Sciences, [Melbourne].
Ciel et Terre, Société Belge d'Astronomie, de Météorologie et de Physique du Globe.
Geofisica Pura e Applicata, Istituto Geofisica Italiano, [Milan].
Geophysical Magazine, [Central Meteorological Observatory, Tokyo].
Hemel en Dampkring, Nederlandse Vereniging voor Weer- en Sterrenkunde, [The Hague].
★**Időjárás,** Az Országos Meteorológiai és Földmágnességi Intézet [Budapest].
★**Indian Journal of Meteorology and Geophysics,** [Delhi].
Journal of Atmospheric and Terrestrial Physics, [London].
Journal of Geophysical Research, [Washington].
★**Journal of Meteorology,** American Meteorological Society, [Boston].
★**Journal Scientifique de la Météorologie,** Société Météorologique de France, [Paris].
★**The Marine Observer,** Air Ministry, Meteorological Office, London.
★**The Meteorological Magazine,** Air Ministry, Meteorological Office, London.
★**Meteorological Society of Japan, Journal,** Second Series, Kisho Shushi, [Tokyo].
★**La Météorologie,** Société Météorologique de France, [Paris].
★**Meteorologische Rundschau,** [Bad-Kissingen].
Meteoros, [Buenos Aires].
★**Monthly Weather Review,** U. S. Weather Bureau, Washington, D. C.
Nature, [London].
Nimbus, Sociedad Meteorológica de Bolivia, [La Paz].
Polarforschung, Archiv für Polarforschung in Kiel, [Kiel, British Zone, Germany].
Revista de Geofísica, Instituto Nacional de Geofísica, [Madrid].
★**Revista Meteorologica,** Junta Nacional de Meteorología, Montevideo.
★**Rivista di Meteorologia Aeronautica,** Associazione Culturale Aeronautica, [Rome].
★**Royal Meteorological Society, Quarterly Journal,** [London].
Royal Society of London, Proceedings, Ser. B.
★**Tellus,** Svenska Geofysiska Föreningen, Stockholm.
Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia, [Moscow-Leningrad].
★**Weather,** Royal Meteorological Society, [London].
★**Weatherwise,** Amateur Weathermen of America, Philadelphia.
★**Wetter und Leben,** Österreichische Gesellschaft für Meteorologie, [Vienna].
★**Zeitschrift für Meteorologie,** Meteorologisches Observatorium, Potsdam.

★ Indicates those periodicals which are primarily meteorological.

TABLE OF CONTENTS

Meteorological Abstracts and Bibliography. Volume 4, Number 5, May 1953

Foreword
Explanations

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

Compendium Articles and Works of Special Interest
General Meteorology
Meteorological Observations and Instruments
- Methods of Observation
- Observational Data
- Instrument Carriers
- Instruments

Synoptic Analysis and Forecasting
Structure and Physics of the Atmosphere
- Structure of the Atmosphere—Ionosphere
- Mechanics and Thermodynamics of the Atmosphere
- General Circulation
- Atmospheric Disturbances

Radiation and Temperature
- Radiation
- Temperature
- Soil Temperatures

Atmospheric Pressure and Wind
- Pressure
- Wind
- Wind Effects
- Upper Air Winds and Vertical Motion

Aqueous Vapor and Hydrometeors
- Humidity and Evaporation
- Cloud Physics and Fog
- Clouds
- Precipitation
- Snow
- Hydrometeorology

Climatology and Bioclimatology
- Climatology
- Climate of Particular Places
- Climatic Changes
- Microclimatology
- Climatic Classification
- Bioclimatology
- Environmental Influences

Miscellaneous Applications
- Solar Influences
- Visibility
- Optical Phenomena
- Electrical Phenomena
- Auroras
- Radio Meteorology
- Acoustical Phenomena

Astrophysics

PART II. SELECTIVE ANNOTATED BIBLIOGRAPHY ON HIGH LEVEL WINDS (500–100 mb)

Outline of Contents
Bibliography on High Level Winds (500–100 mb)
Supplementary Material

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

PART IV. AUTHOR AND SUBJECT INDEXES

Index of Authors
Index of Subjects
Index of Geographical Locations

List of Periodicals ..... Cover